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ASIATIC RESEARCHES

OR

TRANSACTIONS

OF THE

SOCIETY

INSTITUTED IN BENGAL

FOR INQUIRING IN TO THE

HISTORY AND ANTIQUITIES, THE ARTS, SCIENCES,
AND LITERATURE,

OF

ASIA

VOLUME THE SECOND

BHARAT-BHARATI
Oriental Publishers & Booksellers
B 28/15, DURGA KUND, VARANASI-5
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> "The bounds of its investigation will be the geographical limits of Asia: and within these limits its inquiries will be extended to whatever is performed by MAN or produced by NATURE."
>
> SIR WILLIAM JONES.

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ADVERTISEMENT

IT may greatly conduce to the advancement of useful knowledge, if the learned Societies, established in *Europe*, will transmit to the Secretary of the Society in *Bengal* a collection of short and precise Queries on every branch of *Asiatic* History, Natural and Civil, on the Philosophy, Mathematics, Antiquities, and Polite Literature, of *Asia*, and on eastern Arts both liberal and mechanic; since it is hoped, that accurate answers may in due time be procured to any questions, that can be proposed on those subjects, which must in all events be curious and interesting, and may prove in the highest degree beneficial to mankind.

CONTENTS OF THE SECOND VOLUME.

I. Discourse the Fourth, on the *Arabs* ... 5
II. Discourse the Fifth, on the *Tartars* ... 18
III. Discourse the Sixth, on the *Persians* ... 35
IV. On the Descent of the *Afghans* from the *Jews* ... 54
V. On the Island of *Hinzuán* 62
VI. On the *Indian* Gross-beak 86
VII. On the Chronology of the *Hindus* ... 88
VIII. On the Cure of the *Elephantiasis* 115
IX. On the *Indian* Game of *Chess* 122
X. Inscriptions from the *Vindhya* Mountains ... 128
XI. A Description of *Asám* 130
XII. On the Mountaineers of *Tripura* ... 141
XIII. On the Book of *Chinese* Odes ... 147
XIV. On the Introduction of *Arabic* into *Parsian* ... 159
XV. On the Astronomy of the *Hindus* ... 175
XVI. On the *Indian* Zodiac ... 227
XVII. An Accouut of *Népál* ... 241
XVIII. On the Cure of Persons bitten by Snakes ... 254
XIX. On some Roman Coins found at *Nelore* ... 259
XX. On two *Indian* Festivals, and the *Sphinx* ... 261
XXI. On the Isle of Carnicobar ... 264
XXII. On the Medicinal Plants of *India* ... 270
XXIII. On the Dissection of the *Pangolin* ... 277
XXIV. On the *Lac* Insect ... 282
XXV. Discourse the Seventh, on the *Chinese* ... 285
XXVI. An Inscription found near *Islamábád* ... 299
XXVII. A Supplement to No. VII ... 303
XXVIII. On the Spikenard of the Ancients ... 315
APPENDIX: I. A Meteorological Diary ... 327
II. On the Cases in deducing the Longitude &c. 379
III On an Ancient Building in *Hájipur* ... 381
IV. On some Eclipses of *Jupiter's* Satellites .. 385
V. On the *Hindu* Binomial Theorem ... 388

☞There was not room in this volume for the Dissertations on the Music of the *Hindus* and the Laws of *Siam*; but they will appear in the Third volume, for which ample materials have been collected.

I.

THE FOURTH ANNIVERSARY DISCOURSE,

DELIVERED 15TH FEBRUARY 1787.

BY THE PRESIDENT.

GENTLEMEN,

I HAD the honour last year of opening to you my intention, to discourse at our annual meetings on the *five* principal nations, who have peopled the continent and islands of *Asia ;* so as to trace, by an historical and philological analysis, the number of ancient stems, from which those five branches have severally sprung, and the central region, from which they appear to have proceeded : you may, therefore, expect, that, having submitted to your consideration a few general remarks on the old inhabitants of *India,* I should now offer my sentiments on some other nation, who, from a similarity of *language, religion, arts,* and *manners,* may be supposed to have had an early connection with the *Hindus ;* but, since we find some *Asiatic* nations totally dissimilar to them in all or most of those particulars, and since the difference will strike you more forcibly by an immediate and close comparison, I design at present to give a short account of a wonderful people, who seem in every respect so strongly contrasted to the original natives of this country, that they must have been for ages a distinct and separate race.

For the purpose of these discourses, I considered *India* on its largest scale, describing it as lying between *Persia* and *China, Tartary* and *Java ;* and, for the same purpose, I now apply the name of *Arabia,* as the *Arabian* Geographers often apply it, to that extensive Peninsula, which the Red Sea devides from *Africa,* the great *Assyrian* river from *Iràn,* and of which the *Erythrean* Sea washes the base ; without excluding any part of its western side, which would be completely meritime, if no isthmus intervened between the *Medi-*

terranean, and the Sea of *Kolzom*: that country in short I call *Arabia*, in which the *Arabic* language and letters, or such as have a near affinity to them, have been immemorially current.

Arabia, thus divided from *India* by a vast ocean, or at least by a broad bay, could hardly have been connected in any degree with this country, until navigation and commerce had been considerably improved: yet, as the *Hindus* and the people of *Yemen* were both commercial nations in a very early age, they were probably the first instruments of conveying to the western world the gold, ivory, and perfumes of *India*, as well as the fragrant wood, called *állúwwa* in *Arabic* and *aguru* in *Sanscrit*, which grows in the greatest perfection in *Anam* or *Cochinchina*. It is possible too, that a part of the *Arabian* Idolatry might have been derived from the same source with that of the *Hindus*; but such an intercourse may be considered as partial and accidental only; nor am I more convinced, than I was fifteen years ago, when I took the liberty to animadvert on a passage in the History of Prince KANTEMIR, that the *Turks* have any just reason for holding the coast of *Yemen* to be a part of *India*, and calling its inhabitants *Yellow Indians*.

The *Arabs* have never been entirely subdued; nor has any impression been made on them, except on their borders; where, indeed, the *Phenicians*, *Persians*, *Ethiopians*, *Egyptians*, and, in modern times, the *Othmàn Tartars*, have severally acquired settlements; but, with these exceptions, the natives of *Hejàz* and *Yemen* have preserved for ages the sole dominion of their deserts and pastures, their mountains and fertile valleys: thus, apart from the rest of mankind, this extraordinary people have retained their primitive manners and language, features and character, as long and as remarkably as the *Hindus* themselves. All the genuine *Arabs* of *Syria* whom I knew in *Europe*, those of *Yemen*, whom I saw in the isle of *Hinzuàn*, whither many had come from *Maskat* for the purpose of trade, and those of *Hezàh*, whom I have met in *Bengal*, from a striking contrast to the *Hindu* inhabitants of these provinces: their eyes are full of vivacity, their speech voluble and articulate, their deportment manly and dignified, their apprehension quick, their minds always present and attentive; with a spirit of independence appearing in the countenances even of the lowest among them. Men will always differ in their ideas of civilization, each measuring it by the habits and

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prejudices of his own country; but, if courtesy and urbanity, a love of poetry and eloquence, and the practice of exalted virtues be a juster measure of perfect society, we have certain proof, that the people of *Arabia*, both on plains and in cities, in republican and monarchical states, were eminently civilized for many ages before their conquest of *Persia*.

It is deplorable, that the ancient History of this majestic race should be as little known in detail before the time of *Dhú Yezen*, as that of the *Hindus* before *Vicramáditya;* for, although the vast historical work of *Alnuwairì*, and the *Murújuldhahab*, or *Golden Meadows* of *Almasûúdì*, contain chapters on the kings of *Himyar*, *Ghasàn*, and *Hírah*, with lists of them and sketches of their several reigns, and although Geneological Tables, from which chronology might be better ascertained, are prefixed to many compositions of the old *Arabian* Poets, yet most manuscripts are so incorrect, and so many contradictions are found in the best of them, that we can scarce lean upon tradition with security, and must have recourseto the same media for investigating the history of the *Arabs*, that I before adopted in regard to that of the *Indians;* namely, their *language*, *letters*, and *religion*, their ancient *monuments*, and the certain remains of their *arts;* on each of which heads I shall touch very concisely, having premised, that my observations will in general be confined to the state of *Arabia* before that singular revolution, at the beginning of the *seventh century*, the effects of which we feel at this day from the *Pyrenean* mountains and the *Danube*, to the farthest parts of the *Indian Empire*, and even to the Eastern Islands.

I. For the knowledge, which any *European*, who pleases, may attain of the *Arabian* language, we are principally indebted to the university of *Lyden;* for, though several *Italians* have assiduously laboured in the same wide field, yet the fruit of their labours has been rendered almost useless by more commodious and more accurate works printed in *Holland;* and, though POCOCK certainly acaccomplished much, and was able to accomplish any thing, yet the *Academical* ease, which he enjoyed, and his theological pursuits, induced him to leave unfinished the valuable work of *Maidánì*, which he had prepared for publication; nor, even if that rich mine of *Arabian* Philology had seen the light, would it have borne any comparison with the fifty dissertations of *Harírì*, which the first

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ALBERT SCHULTENS translated and explained, though he sent abroad but few of them, and has left his worthy grandson, from whom perhaps *Maidánì* also may be expected, the honour of publishing the rest: but the palm of glory in this branch of literature is due to GOLIUS, whose works are equally profound and elegant; so perspicuous in method, that they may always be consulted without fatigue, and read without languor, yet so abundant in matter, that any man, who shall begin with his noble edition of the Grammar compiled by his master ERPENIUS, and proceed, with the help of his incomparable dictionary, to study his History of *Taimúr* by *Ibni Arabsháh*, and shall make himself complete master of that sublime work, will understand the learned *Arabic* better than the deepest scholar at *Constantinople* or at *Mecca*. The *Arabic* language, therefore, is almost wholly in our power; and, as it is unquestionably one of the most ancient in the world, so it yields to none ever spoken by mortals in the number of its words and the precision of its phrases; but it is equally true and wonderful, that it bears not the least resemblance, either in words or the structure of them, to the *Sanscrit*, or great parent of the *Indian* dialects; of which dissimilarity I will mention two remarkable instances: the *Sanscrit*, like the *Greek*, *Persian*, and *German*, delights in compounds, but, in a much higher degree, and indeed to such excess, that I could produce words of more than twenty syllables, not formed ludicrously, like that by which the buffoon in ARISTOPHANES describes a feast, but with perfect seriousness, on the most solemn occasions, and in the most elegant works; while the *Arabic*, on the other hand, and all its sister dialects, abhor the composition of words, and invariably express very complex ideas by circumlocution; so that, if a compound word be found in any genuine language of the *Arabian* Peninsula, (*zenmerdah* for instance, which occurs in the *Hamásah*) it may at once be pronounced an exotic. Again; it is the genius of the *Sanscrit*, and other languages of the same stock, that the roots of verbs be almost universally *biliteral*, so that *five and twenty hundred* such roots might be formed by the composition of the *fifty Indani* letters; but the *Arabic* roots are as universally *triliteral*, so that the composition of the *twenty-eight Arabian* letters would give near *two and twenty thousand elements* of the language: and this will demonstrate the surprising extent of it; for, although great numbers of its roots are confessedly lost, and some, perhaps, were never in use, yet, if we suppose ten thousand of them (without reckoning *quadriliterals*) to exist, and each of them to admit only *five* variations, one with another, in forming *derivative nouns*, even then a perfect *Arabic* dictionary ought to contain *fifty thousand* words, each of which may receive a multitude of changes by the rules of grammar. The derivatives in *Sanscrit* are considerably more numerous: but a farther comparison between the two languages is here unnecessary; since, in whatever light we view them; they seem totally distinct, and must have been invented by two different races of men; nor do I recollect a single word in common between them, except *Suruj*, the plural of *Siràj*; mean ng both a *lamp* and the *sun*, the *Sanscrit* name of which is, in *Bengal*, pronounced *Sùrja;* and even this resemblance may be purely accidental. We may easily believe with the *Hindus*, that *not even* INDRA *himself and his heavenly bands, much less any mortal, ever comprehended in his mind such an ocean of words as their sacred language contains*, and with the *Arabs*, that no man uninspired was ever a complete master of *Arabic:* in fact no person, I believe, now living in *Europe* or *Asia*, can read without study an hundred couplets together in any collection of ancient *Arabian* poems; and we are told, that the great author of the *Kámùs* learned by accident from the mouth of a child, in a village of *Arabia*, the meaning of three words, which he had long sought in vain from grammarians, and from books, of the highest reputation. It is by approximation alone, that a knowledge of these two venerable languages can be acquired; and, with moderate attention, enough of them both may be known, to delight and instruct us in an infinite degree: I conclude this head with remarking, that the nature of the *Ethiopic* dialect seems to prove an early establishment of the *Arabs* in part of *Ethiopia*, from which they were afterwards expelled, and attacked even in their own country by the *Abyssinians*, who had been invited over as auxiliaries against the tyrant of *Yemen* about a century before the birth of MUHAMMED.

Of the characters, in which the old compositions of *Arabia* were written. we know but little; except that the *Koràn* originally appeared in those of *Cúfah*, from which the modern *Arabian* letters, with all their elegant variations, were derived, and which unquestionably had a common origin with the *Hebrew* or *Chaldaic;* but, as to the *Himyaric* letters, or those which we see mentioned by the name of *Almusnad*, we are still in total darkness; the traveller NIEBUHR having been unfortunately prevented from visiting some ancient monuments in *Yemen*, which are said to have inscriptions on them: if those letters bear a strong resemblance to the *Nágarì*, and if a story current in *India* be true, that some *Hindu* merchants heard the *Sanscrit* language spoken in *Arabia* the *Happy*, we might be confirmed in our opinion, that an intercourse formerly subsisted between the two nations of opposite coasts, but should have no reason to believe, that they sprang from the same immediate stock. The first syllable of *Hamyar*, as many *Europeans* write it, might perhaps induce an Etymologist to derive the *Arabs* of *Yemen* from the great ancestor of the *Indians;* but we must observe, that *Himyar* is the proper appellation of those *Arabs;* and many reasons concur to prove, that the word is purely *Arabic:* the similarity of some proper names on the borders of *India* to those of *Arabia*, as the river *Arabius*, a place called *Araba*, a people named *Aribes* or *Arabies*, and another called *Sabai*, is indeed remarkable, and may hereafter furnish me with observations of some importance, but not at all inconsistent with my present ideas.

II. It is generally asserted, that the old religion of the *Arabs* was entirely *Sabian;* but I can offer so little accurate information concerning the *Sabian* faith, or even the meaning of the word, that I dare not yet speak on the subject with confidence. This at least is certain, that the people of *Yemen* very soon fell into the common, but fatal, error of adoring the Sun and the Firmament; for even the *third* in descent from YOKTAN, who was consequently as old as NAHOR, took the surname of ABDUSHAMS, or *Servant of the Sun;* and his family, we are assured, paid particular honours to that luminary: other tribes worshipped the planets and fixed stars; but the religion of the poets at least seems to have been pure Theism; and this we know with certainity, because we have *Arabian* verses of unsuspected antiquity, which contain pious and elevated sentiments on the goodness and justice, the power and omnipresence, of ALLAH, or THE GOD. If an inscription, said to have been found on marble in *Yemen*, be authentic, the ancient inhabitants of that country preserved the religion of EBER, and professed a belief *in miracles and a future state.*

We are also told, that a strong resemblance may be found between the religions of the pagan *Arabs* and the *Hindus ;* but, though this may be true, yet an agreement in worshipping the sun and stars will not prove an affinity between the two nations : the *powers* of God represented as *female* deities, the adoration of *stones*, and the name of the Idol WUDD, may lead us indeed to suspect, that some of the *Hindu* superstitions had found their way into *Arabia ;* and, though we have no traces in *Arabian* History of such a conqueror or legislator as the great SESAC, who is said to have raised pillars in *Yemen* as well as at the mouth of the *Ganges*, yet, since we know, that SA'CYA is a title of BUDDHA, whom some suppose to be WODEN, since BUDDAH was not a native of *India*, and since the age of SESAC perfectly agrees with that of SA'CYA, we may form a plausible conjecture, that they were in fact the same person, who travelled eastward from *Ethiopia*, either as a warrior or as a lawgiver, about a thousand years before CHRIST, and whose rites we now see extended as far as the country of *Nifon*, or, as the *Chinese* call it, *Fapuen*, both words signifying the *Rising Sun*. SA'CYA may be derived from a word meaning *power*, or from another denoting *vegetable food ;* so that this epithet will not determine, whether he was a hero or a philosopher ; but the title BUDDHA, or *wife*, may induce us to believe, that he was rather a benefactor, than a destroyer, of his species : if his religion, however, was really introduced into any part of *Arabia*, it could not have been general in that country ; and we may safely pronounce, that before the *Mohammedan* revolution, the noble and learned *Arabs* were Theists, but that a stupid idolatry prevailed among the lower orders of the people.

I find no trace among them, till their emigration, of any Philosophy but *Ethics ;* and even their system of morals, generous and enlarged as it seems to have been in the minds of a few illustrious chieftains, was on the whole miserably depraved for a century at least before MUHAMMED : the distinguishing virtues, which they boasted of inculcating and practising, were a contempt of riches and even of death ; but, in the age of the *Seven Poets*, their liberality had deviated into mad profusion, their courage into ferocity, and their patience into an obstinate spirit of encountering fruitless dangers; but I forbear to expatiate on the manners of the *Arabs* in that age, because the poems, entitled *Almoâllakât*, which have appeared in our own language, exhibit an exact picture of their virtues and their vices, their wisdom and their folly; and show what may be constantly expected from men of open hearts and boiling passions, with no law to control, and little religion to restrain, them.

III. Few monuments of antiquity are preserved in *Arabia*, and of those few the best accounts are very uncertain; but we are assured, that inscriptions on rocks and mountains are still seen in various parts of the Peninsula; which, if they are in any known language, and if correct copies of them can be procured, may be decyphered by easy and infallible rules.

The first ALBERT SCHULTENS has preserved in his Ancient Memorials of *Arabia*, the most pleasing of all his works, two little poems in an elegiac strain, which are said to have been found, about the middle of the seventh century, on some fragments of ruined edifices in *Hadramût* near *Aden*, and are supposed to be of an indefinite, but very remote, age. It may naturally be asked: In what characters were they written? Who decyphered them? Why were not the original letters preserved in the book, where the verses are cited? What became of the marbles, which *Abdurrahman*, then governor of *Yemen*, most probably sent to the *Khalífah* at *Bagdad?* If they be genuine, they prove the people of *Yemen* to have been 'herdsmen and warriors, inhabting a fertile and well-watered country full of game, and near a fine sea abounding with fish, under a monarchical government, and dressed in green silk or vests of needlework,' either of their own manufacture or imported from *India*. The measure of these verses is perfectly regular, and the dialect undistinguishable, at least by me, from that of *Kuraish;* so that, if the *Arabian* writers were much addicted to literary impostures, I should strongly suspect them to be modern compositions on the instability of human greatness, and the consequences of irreligion, illustrated by the example of the *Himyaric* princes; and the same may be suspected of the first poem quoted by SCHULTENS, which he ascribes to an *Arab* in the age of SOLOMON.

The supposed houses of the people called *Thamûd* are also still to be seen in excavation of rocks; and, in the time of TABRIZI the Grammarian, a castle was extant in *Yemen*, which bore the name of ALADBAT, an old bard and warrior, who first, we are told, formed his army, thence called *alkhamìs*, in *five* parts, by which arrangement he defeated the troops of *Himyar* in an expedition against *Sanâà*.

Of pillars erected by SESAC, after his invasion of *Yemen*, we find no mention in *Arabian* histories; and, perhaps, the story has no more foundation than another told by the *Greeks* and adopted by NEWTON, that the *Arabs* worshipped URANIA, and even BACCHUS by name, which, they say, means *great* in *Arabic;* but where they found such a word, we cannot discover: it is true, that *Beccah* signifies *a great and tumultuous crowd*, and, in this sense, is one name of the sacred city commonly called *Meccah*.

The *Câbah*, or *quadrangular* edifice at *Meccah*, is indisputably so ancient, that its original use, and the name of its builder, are lost in a cloud of idle traditions. An *Arab* told me gravely, that it was raised by ABRAHAM, who, as I assured him, was never there: others ascribe it, with more probablity, to ISMAIL,or one of his immediate descendants; but whether it was built as a place of divine worship, as a fortress, as a sepulchre, or as a monument of the treaty between the old prossessors of *Arabia* and the sons of KIDAR, antiquaries may dispute, but no mortal can determine. It is thought by RELAND to have been *the mansion of some ancient Patriarch, and revered on that account by his posterity;* but the room, in which we now are assembled, would contain the whole *Arabian* edifice; and, if it were large enough for the dwelling-house of a patriarchal family, it would seem ill adapted to the pastoral manners of the *Kedarites:* a *Persian* author insists, that the true name of *Meccah* is *Mahcadah*, or the *Temple of the Moon;* but, although we may smile at his etymology, we cannot but think it probable, that the *Câbah* was originally designed for religious purposes. Three couplets are cited in an *Arabic* History of this building, which, from their extreme simplicity, have less appearance of imposture than other verses of the same kind: they are ascribed to ASAD, a *Tobbâ*, or king *by succession*, who is generally allowed to have reigned in *Yemen* an hundred and twenty-eight years before CHRIST'S birth, and they commemorate, without any poetical im-

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agery, the magnificence of the prince *in covering the holy temple with striped cloth and fine linen, and in making keys for its gate.* This temple, however, the sanctity of which was restored by MUHAMMED, had been strangely profaned at the time of his birth, when it was usual to decorate its walls with poems on all subjects, and often on the triumphs of *Arabian* gallantry and the praises of *Greecian* wine, which the merchants of *Syria* brought for sale into the deserts.

From the want of materials on the subject of *Arabian* antiquity, we find it very difficult to fix the Chronology of the *Ismailites* with accuracy beyond the time of ADNAN, from whom the impostor was descended in the *twenty-first* degree ; and, although we have genealogies of ALKAMAH and other *Himyaric* bards as high as the *thirtieth* degree, or for a period of *nine hundred* years at least, yet we can hardly depend on them so far, as to establish a complete chronological system : by reasoning downwards, however, we may ascertain some points of considerable importance. The universal tradition of *Yemen* is, that YOKTAN, the són of EBER, first settled his family in that country ; which settlement, by the computation admitted in *Europe*, must have been above *three thousand six hundred* years ago, and nearly at the time, when the *Hindus*, under the conduct of RAMA, were subduing the first inhabitants of these regions, and extending the *Indian* Empire from *Ayódhyà* or *Audh* as far as the isle of *Sinhal* or *Silàn*. According to this calculation, NUUMAN, king of *Yemen* in the *ninth* generation from EBER, was contemporary with JOSEPH ; and, if a verse composed by that prince, and quoted by ABULFEDA, was really preserved, as it might easly have been, by oral tradition, it proves the great antiquity of the *Arabian* language and metre. This is a literal version of couplet : 'When thou, who art in power, conductest affairs with courtesy, thou attainest the high honours of those, who are most exalted, *and* whose mandates are obeyed.' We are told, that from an elegant verb in this distich, the royal poet acquired the surname of *Almuâáfer*, or the *Courteous.* Now the reasons for believing this verse genuine are its brevity, which made it easy to be remembered, and the good sense comprized in it, which made it become proverbial ; to which we may add, that the dialect is apparently old, and differs in three words from the idiom of *Hejàz :*

the reasons for doubting are, that sentences and verses of indefinite antiquity are sometimes ascribed by the *Arabs* to particular persons of eminence ; and they even go so far as to cite a pathetic elegy of ADAM himself on the death of ABEL, but in very good *Arabic* and correct measure. Such are the doubts, which necessarily must arise on such a subject ; yet we have no need of ancient monuments or traditions to prove all that our analysis requires, namely, that the *Arabs*, both of *Hejàz* and *Yemen*, sprang from a stock entirely different from that of the *Hindus*, and that their first establishments in the respective countries, where we now find them, were nearly coeval.

I cannot finish this article without observing, that, when the King of *Denmark's* ministers instructed the *Danish* travellers to collect *historical* books in *Arabic*, but not to busy themselves with procuring *Arabian poems*, they certainly were ignorant, that the only monuments of old *Arabian* History are collections of poetical pieces and the commentaries on them ; that all memorable transactions in *Arabia* were recorded in verse ; and that more certain facts may be known by reading the *Hamàsah*, *the Diwàn* of *Hudhail*, and the valuable work of *Obaidullah* than by turning over a hundred volumes in prose, unless indeed those poems are cited by the historians as their authorities.

IV. The manners of the *Hejàzì Arabs*, which have continued, we know, from the time of SOLOMON to the present age, were by no means favourable to the cultivation of *arts* ; and, as to *sciences*, we have no reason to believe, that they were acquainted with any ; for the mere amusement of giving names to stars, which were useful to them in their pastoral or predatory rambles through the deserts, and in their observations on the weather, can hardly be considered as a material part of astronomy. The only arts, in which they pretended to excellence, (I except horsemanship and military accomplishments) were *poetry* and *rhetoric :* that we have none of their compositions in prose before the *Koràn*, may be ascribed, perhaps, to the little skill, which they seem to have had, in writing; to their predilection in favour of poetical measure, and to the facility, with which verses are committed to memory ; but all their stories prove, that they were eloquent in a high degree, and possessed wonderful powers of speaking without preparation in flowing and forcible periods. I have never been able to discover, what was meaned by their books, called *Rawásìm*, but suppose, that they were collections of their common, or customary, law. Writing was so little practised among them, that their old poems, which are now accessible to us, may almost be considered as originally unwritten ; and I am inclined to think, that SAMUEL JOHNSON'S reasoning, on the extreme imperfection of unwritten languages, was too general ; since a language, that is only spoken, may nevertheless be highly polished by a people, who, like the ancient *Arabs*, make the improvement of their idiom a national concern, appoint solemn assemblies for the purpose of displaying their poetical talents, and hold it a duty to exercise their children in getting by heart their most approved compositions.

The people of *Yemen* had possibly more *mechanical arts*, and, perhaps, more *science ;* but, although their ports must have been the emporia of considerable commerce between *Egypt* and *India* or part of *Persia*, yet we have no certain proofs of their proficiency in navigation or even in manufactures. That the *Arabs* of the desert had musical instruments, and names for the different notes, and that they were greatly delighted with melody, we know from themselvs ; but their lutes and pipes were probably very simple, and their music, I suspect, was little more than a natural and tuneful recitation of their elegiac verses and love-songs. The singular property of their language, in shunning compound words, may be urged, according to BACON'S idea, as a proof, that they had made no progress in *arts*, 'which require, says he, a variety of combinations to express the complex notions arising from them ;' but the singularity may perhaps be imputed wholly to the genious of the language, and the taste of those, who spoke it ; since the old *Germans*, who knew no art, appear to have delighted in compound words, which poetry and oratory, one would conceive, might require as much as any meaner art whatsoever.

So great, on the whole, was the strength of parts or capacity, either natural or acquired from habit, for which the *Arabs* were ever distinguished, that we cannot be surprised, when we see that blaze of genius, which they displayed, as far as their arms extended, when they burst, like their own dyke of *Arim*, through their ancient limits, and spread, like an inundation, over the great empire of *Iran.* That a race of *Tázìs*, or *Coursers* as the *Persians* call them, 'who drank the milk of camels and fed on lizards, should entertain a thought of subduing the kingdom of FERIDUN' was considered by the General of YEZDEGIRD'S army as the strongest instance of fortune's levity and mutability ; but FIRDAUSI, a complete master of *Asiatic* manners, and singularly impartial, represents the *Arabs*, even in the age of FERIDUN, as 'disclaiming any kind of dependence on that monarch, exulting in their liberty, delighting in eloquence, acts of liberality, and martial achievements, and thus making the whole earth, says the poet, red as wine with the blood of their foes, and the air like a forest of canes with their tall spears.' With such a character they were likely to conquer any country, that they could invade ; and, if ALEXANDER had invaded their dominions, they would unquestionably have made an obstinate, and probably a successful, resistance.

But I have detained you too long, gentlemen, with a nation, who have ever been my favourites, and hope at our next anniversary meeting to travel with you over a part of *Asia*, which exhibits a race of men distinct both from the *Hindus* and from the *Arabs.* In the mean time it shall be my care to superintend the publication of your transactions, in which, if the learned in *Europe* have not raised their expectations too high, they will not, I believe, be disappointed : my own imperfect essays I always except ; but, though my other engagements have prevented my attendance on your society for the greatest part of last year, and I have set an example of that freedom from restraint, without which no society can flourish, yet, as my few hours of leisure will now be devoted to *Sanscrit* literature, I cannot but hope, though my chief object be a knowledge of *Hindu* Law, to make some discovery in other sciences, which I shall impart with humility, and which you will, I doubt not, receive with indulgence.

II.

THE FIFTH ANNIVERSARY DISCOURSE,

DELIVERED 21ST FEBRUARY 1788.

BY THE PRESIDENT.

AT the close of my last address to you, Gentlemen, I declared my design of introducing to your notice a people of *Asia*, who seemed as different in most respects from the *Hindus* and *Arabs*, as those two nations had been shown to differ from each other ; I meaned the people, whom we call *Tartars* : but I enter with extreme diffidence on my present subject, because I have little knowledge of the *Tartarian* dialects ; and the gross errors of *European* writers on *Asiatic* literature have long convinced me, that no satisfactory account can be given of any nation, with whose language we are not perfectly acquainted. Such evidence, however, as I have procured by attentive reading and scrupulous inquiries, I will now lay before you, interspersing such remarks as I could not but make on that evidence, and submitting the whole to your impartial decision.

Conformably to the method before adopted in describing *Arabia* and *India*, I consider *Tartary* also, for the purpose of this discourse, on its most extensive scale, and request your attention, whilst I trace the largest boundaries that are assignable to it : conceive a line drawn from the mouth of the *Oby* to that of the *Dnieper*, and, bringing it back eastward across the *Euxine*, so as to include the peninsula of *Krim*, extend it along the foot of *Caucasus*, by the rivers *Cur* and *Aras*, to the *Caspian* lake, from the opposite shore of which follow the course of the *Jaihun'* and the chain of *Caucasean* hills as far as those of *Imaus* ; whence continue the line beyond the *Chinese* wall to the White Mountain and the country of *Yetso* ; skirting the borders of *Persia*, *India*, *China*, *Corea*, but including part of *Russia*, with all the districts which lie between the Glacial sea, and that of *Japan*. M. DE GUIGNES, whose great work on the

Huns abounds more in solid learning than in rhetorical ornaments, presents us, however, with a magnificent image of this wide region; describing it as a stupendous edifice, the beams and pillars of which are many ranges of lofty hills, and the dome, one prodigious mountain, to which the *Chinese* give the epithet of *Celestial*, with a considerable number of broad rivers flowing down its sides: if the mansion be so amazingly sublime, the land around it is proportionably extended, but more wonderfully diversified; for some parts of it are incrusted with ice, others parched with inflamed air and covered with a kind of lava; here we meet with immense tracts of sandy deserts and forests almost impenetrable; there, with gardens, groves, and meadows, perfumed with musk, watered by numberless rivulets, and abounding in fruits and flowers; and, from east to west, lie many considerable provinces, which appear as valleys in comparison of the hills towering above them, but in truth are the flat summits of the highest mountains in the world, or at least the highest in *Asia*. Near one fourth in latitude of this extraordinary region is in the same charming climate with *Greece*, *Italy*, and *Provence;* and another fourth in that of *England*, *Germany*, and the northern parts of *France;* but the *Hyperborean* countries can have few beauties to recommend them, at least in the present state of the earth's temperature: to the south, on the frontiers of *Irán* are the beautiful vales of *Soghd* with the celebrated cities of *Samarkand* and *Bokhárà;* on those of *Tibet* are the territories of *Cashghar*, *Khoten*, *Chegil* and *Khátà*, all famed for perfumes and for the beauty of their inhabitants; and on those of *China* lies the country of *Chín*, anciently a powerful kingdom, which name, like that of *Khátà*, has in modern times been given to the whole *Chinese* empire, where such an appellation would be thought an insult. We must not omit the fine territory of *Tancút*, which was known to the *Greeks* by the name of *Serica*, and considered by them as the farthest eastern extremity of the habitable globe.

Scythia seems to be the general name, which the ancient *Europeans* gave to as much as they knew of the country thus bounded and described; but, whether that word be derived, as PLINY seems to intimate, from *Sacai*, a people known by a similar name to the *Greeks* and *Persians*, or, as BRYANT imagines, from *Cuthia*, or, as Colonel VALLANCEY believes, from words denoting *navigation*, or, as it might have been supposed, from a *Greek* root implying *wrath* and ferocity, this at least is certain, that, as *India, China, Persia, Japan*, are not appellations of those countries in the languages of the nations, who inhabit them, so neither *Scythia* nor *Tartary* are names, by which the inhabitants of the country now under our consideration have ever distinguished themselves. *Tátáristàn* is, indeed, a word used by the *Persians* for the south-western part of *Scythia*, where the musk-deer is said to be common; and the name *Tátàr* is by some considered as that of a particular tribe; by others, as that of a small river only; while *Túràn*, as opposed to *Iràn*, seems to mean the ancient dominion of AFRA´SIA´B to the north and east of the *Oxus*. There is nothing more idle than a debate concerning names, which after all are of little consequence, when our ideas are distinct without them: having given, therefore, a correct notion of the country, which I proposed to examine, I shall not scruple to call it by the general name of *Tartary;* though I am conscious of using a term equally improper in the pronunciation and the application of it.

Tartary then, which contained, according to PLINY, *an innumerable multitude of nations*, by whom the rest of *Asia* and all *Europe* has in different ages been over-run, is denominated, as various images have presented themselves to various fancies, the *great hive of the northern swarms*, the *nursery of irresistible legions*, and, by a stronger metaphor, the *foundery of the human race;* but M. BAILLY, a wonderfully ingenious man and a very lively writer, seems first to have considered it as the *cradle of our species*, and to have supported an opinion, that the whole ancient world was enlightened by sciences brought from the most northern parts of *Scythia*, particularly from the banks of the *Jenisea*, or from the *Hyperborean*, regions: all the fables of old *Greece*, *Italy*, *Persia*, *India*, he derives from the north; and it must be owned, that he maintains his paradox with acuteness and learning. Great learning and great acuteness, together with the charms of a most engaging style, were indeed necessary to render even tolerable a system, which places an earthly paradise, the gardens of *Hesperus*, the islands of the *Macares*, the groves of *Elysium*, if not of *Eden*, the heaven of INDRA, the *Peristàn*, or fairy-land, of the *Persian* poets, with its city of diamonds and its country of *Shádcàm*, so named from *Pleasure* and *Love*, not in any

4366

climate, which the common sense of mankind considers as the seat of delights, but beyond the mouth of the *Oby*, in the Frozen Sea, in a region equalled only by that, where the wild imagination of DANTE led him to fix the worst of criminals in a state of punishment after death, and of which *he could not*, he says, *even think without shivering*. A very curious passage in a tract of PLUTARCH on *the figure in the Moon's orb*, naturally induced M. BAILLY to place *Ogygia* in the north, and he concludes that island, as others have concluded rather fallaciously, to be the *Atlantis* of PLATO, but is at a loss to determine, whether it was *Iseland* or *Grœnland*, *Spitzberg* or *New Zembla:* among so many charms it was difficult, indeed, to give a preference; but our philosopher, though as much perplexed by an option of beauties as the shepherd of *Ida*, seems on the whole to think *Zembla* the most worthy of the *golden fruit;* because it is indisputably an island, and lies opposite to a gulph near a continent, from which a great number of rivers descend into the ocean. He appears equally distressed among five nations, real and imaginary, to fix upon that, which the *Greeks* named *Atlantes;* and his conclusion in both cases must remind us of the showman at *Eton*, who, having pointed out in his box all the crowned heads of the world, and being asked by the schoolboys, who looked through the glass, which was the Emperor, which the Pope, which the Sultan, and which the Great Mogul, answered eagerly, 'which you please, young gentlemen, which you please.' His letters, however, to VOLTAIRE, in which he unfolds his new system to his friend, whom he had not been able to convince, are by no means to be derided; and his general proposition, that arts and sciences had their source in *Tartary*, deserves a longer examination than can be given to it in this discourse: I shall, nevertheless, with your permission, shortly discuss the question under the several heads, that will present themselves in order.

Although we may naturally suppose, that the numberless communities of *Tartars* some of whom are established in great cities, and some encamped on plains in ambulatory mansions, which they remove from pasture to pasture, must be as different in their features as in their dialects, yet, among those who have not emigrated into another country and mixed with another nation, we may discern a family likeness, especially in their eyes and countenance, and in that configuaration of lineaments, which we generally call a *Tartar* face; but, without making anxious inquiries, whether all the inhabitants of the vast region before described have similar features, we may conclude from those, whom we have seen, and from the original portraits of TAIMU′R and his descendants, that the *Tartars* in general differ wholly in complexion and countenance from the *Hindus* and from the *Arabs*: an observation, which tends in some degree to confirm the account given by modern *Tartars* themselves of their descent from a common ancestor. Unhappily their lineage cannot be proved by authentic pedigrees or historical monuments; for all their writings extant, even those in the *Mogul* dialect, are long subsequent to the time of MUHAMMED; nor is it possible to distinguish their genuine traditions from those of the *Arabs*, whose religious opinions they have in general adopted. At the beginning of the *fourteenth* century, *Khwájah* RASHI´D, surnamed FAD LU'LLAH, a native of *Kazvìn*, compiled his account of the *Tartars* and *Mongals* from the papers of one PU´LA´D, whom the great grandson of HOLACU′ had sent into *Tátáristàn* for the sole purpose of collecting historical information; and the commission itself shows, how little the *Tartarian* Princes really knew of their own origin. From this work of RASHI´D, and from other materials, ABU´'LGHA´ZI′, King of *Khwárezm*, composed in the *Mogul* language his *Genealogical History*, which having been purchased from a merchant of *Bokhárà* by some *Swedish* officers, prisoners of war in *Siberia*, has found its way into several *European* tongues: it contains much valuable matter, but, like all MUHAMMEDAN histories, exhibits tribes or nations as individual sovereings; and, if Baron DE TOTT had not strangely neglected to procure a copy of the *Tartarian* history, for the original of which he unnecessarily offered a large sum, we should probably have found, that it begins with an account of the deluge taken from the *Korán*, and proceeds to rank TURC, CHI′N, TATA′R, and MONGAL, among the sons of YA′FET. The genuine traditional history of the *Tartars*, in all the books that I have inspected, seems to begin with OGHU′Z, as that of the *Hindus* does with RA′MA: they place their miraculous Hero and Patriarch *four thousand* years before CHENGIZ KHA′N, who was born in the year 1164, and with whose reign their historical period commences. It is rather surprising, that M. BAILLY, who makes frequent appeals to Etymological arguments.

has not derived OGYCES from OGHÚZ and ATLAS from *Altai*, or the *Golden* mountain of *Tartary*: the *Greek* terminations might have been rejected from both words; and a mere transposition of letters is no difficulty with an Etymologist.

My remarks in this address, gentlemen, will be confined to the period preceding CHENGIZ; and, although the learned labours of M. DE GUIGNES and the fathers VISDELOU, DEMAILLA, and GAUBIL, who have made an incomparable use of their *Chinese* literature, exhibit probable accounts of the *Tartars* from a very early age, yet the old historians of *China* were not only foreign, but generally hostile, to them, and for both those reasons, either through ignorance or malignity, may be suspected of misrepresenting their transactions: if they speak truth, the ancient history of the *Tartars* presents us, like most other histories, with a series of assassinations, plots, treasons, massacres, and all the natural fruits of selfish ambition. I should have no inclination to give you a sketch of such horrors, even if the occasion called for it; and will barely observe, that the first king of the *Hyumnu's* or *Huns* began his reign, according to VISDELOU, about *three thousand five hundred and sixty years ago*, not long after the time fixed in my former discourses for the first regular establishments of the *Hindus* and *Arabs* in their several countries.

I. Our first inquiry, concerning the *languages* and *letters* of the *Tartars*, presents us with a deplorable void, or with a prospect as barren and dreary as that of their deserts. The *Tartars*, in general, had no literature: (in this point all authorities appear to concur) the *Turcs* had no letters: the *Huns*, according to PROCOPIUS, had not even heard of them: the magnificent CHENGIZ, whose Empire included an area of near eighty square degrees, could find none of his own *Mongals*, as the best authors inform us, able to write his dispatches; and TAI'MU'R, a savage of strong natural parts and passionately fond of hearing histories read to him, could himself neither write nor read. It is true, that IBNU ARABSHAH mentions a set of characters called *Dilbe-jìn*, which were used in *Khátà*: 'he had seen them, he says, and found them to consist of *forty-one* letters, a distinct symbol being appropriated to each long and short vowel, and to each consonant hard or soft, or otherwise varied in pronunciation;' but *Khátà* was in southern *Tartary* on the confines of *India;* and, from his description of the characters there in use, we cannot but suspect them to have been those of *Tibet*, which are manifestly *Indian*, bearing a greater resemblance to those of *Bengal* than to *Dévanágarì*. The learned and eloquent *Arab* adds, 'that the *Tatàrs* of *Khátà* write, in the *Dilberjìn* letters, all their tales and histories, their journals, poems, and miscellanies, their diplomas, records of state and justice, the laws of CHENGIZ, their public registers and their compositions of every species:' if this be true, the people of *Khátà* must have been a polished and even a lettered nation; and it may be true, without affecting the *general* position, that the *Tartars* were illiterate; but IBNU ARABSHA'H was a professed rhetorician, and it is impossible to read the original passage, without full conviction that his object in writing it, was to display his power of words in a flowing and modulated period. He says further, that in *Jaghatáï* the people of *Oighùr*, as he calls them, 'have a system of *fourteen* letters only, denominated from themselves *Oighúrì*;' and those are the characters, which the *Mongals* are supposed by most authors to have borrowed: ABU'L'GHAZI' tells us only, that CHENGIZ employed the natives of *Eighùr* as excellent penmen; but the *Chinese* assert, that he was forced to employ them, because he had no writers at all among his natural born subjects; and we are assured by many, that KUBLAIKHA'N ordered letters to be invented for his nation by a *Tibetian*, whom he rewarded with the dignity of chief *Lama*. The small number of *Eighùrì* letters might induce us to believe, that they were *Zend* or *Pahlavì*, which must have been current in that country, when it was governed by the sons of FERIDU'N; and, if the alphabet ascribed to the *Eighurians* by M. DES HAUTESRAYES be correct, we may safely decide, that in many of its letters it resembles both the *Zend* and the *Syriac*, with a remarkable difference in the mode of connecting them; but, as we can scarce hope to see a genuine specimen of them, our doubt must remain in regard to their form and origin: the page, exhibited by HYDE as *Khatáyan* writing, is evidently a sort of broken *Cúfic;* and the fine manuscript at *Oxford*, from which it was taken, is more probably a *Mendean* work on some religious subject than, as he imagined, a code of *Tartarian* laws. That very learned man appears to have made a worse mistake in giving us for *Mongal* characters a page of writing, which has the appearance of *Japanese*. or mutilated *Chinese*, letters.

If the *Tartars* in general, as we have every reason to believe,

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had no written memorials, it cannot be thought wonderful, that their *languages*, like those of *America*, should have been in perpetual fluctuation, and that more than fifty dialects, as HYDE had been credibly informed, should be spoken between *Moscow* and *China*, by the many kindred tribes or their several branches, which are enumerated by ABU'LGHA'ZI'. What those dialects are, and whether they really sprang from a common stock, we shall probably learn from MR. PALLAS, and other indefatigable men employed by the *Russian* court; and it is from the *Russians*, that we must expect the most accurate information concerning their *Asiatic* subjects: I persuade myself, that, if their inquiries be judiciously made and faithfully reported, the result of them will prove, that all the languages properly *Tartarian* arose from one common source; excepting always the jargons of such wanderers or mountaineers, as, having long been devided from the main body of the nation, must in a course of ages have framed separate idioms for themselvs. The only *Tartarian* language, of which I have any knowledge, is the *Turkish* of *Constantinople*, which is however so copious, that whoever shall know it perfectly, will easily understand, as we are assured by intelligent authors, the dialects of *Tátáristàn;* and we may collect from ABU'LGHA'ZI', that he would find little difficulty in the *Calmac* and the *Mogul:* I will not offend your ears by a dry catalogue of similar words in those different languages; but a careful investigation has convinced me, that, as the *Indian* and *Arabian* tongues are severally descended from a common parent, so those of *Tartary* might be tracted to one ancient stem essentially differing from the two others. It appears, indeed, from a story told by ABU'LGHA'ZI', that the *Viràts* and the *Mongals* could not understand each other; but no more can the *Danes* and the *English*, yet their dialects beyond a doubt are branches of the same *Gothic* tree. The dialect of the *Moguls*, in which some histories of TAIMU'R and his descendants where originally composed, is called in *India*, where a learned native set me right when I used another word *Turcì;* not that it is precisely the same with the *Turkish* of the *Othmánlu's*, but the two idioms differ, perhaps, less than *Swedish* and *German*, or *Spanish* and *Portuguese*, and certainly less than *Welsh* and *Irish:* in hope of ascertaining this point, I have long searched in vain for the original works ascribed to TAIMU'R and BA'BER; but all the *Moguls*, with whom I

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have conversed in this country, resemble the crow in one of their popular fables, who, having long affected to walk like a pheasant, was unable after all to acquire the gracefulness of that elegant bird, and in the mean time unlearned his own natural gait: they have not learned the dialect of *Persia*, but have wholly forgotten that of their ancestors. A very considerable part of the old *Tartarian* language, which in *Asia* would probably have been lost, is happily preserved in *Europe*; and, if the groundwork of the western *Turkish*, when separated from the *Persian* and *Arabic*, with which it is embellished, be a branch of the lost *Oghúzian* tongue, I can assert with confidence, that it has not the least resemblance either to *Arabic* or *Sanscrit*, and must have been invented by a race of men wholly distinct from the *Arabs* or *Hindus*. This fact alone oversets the system of M. BAILLY, who considers the *Sanscrit*, of which he gives in several places a most erroneous account, as '*a fine monument of his primeval* Scythians, *the preceptors of mankind and planters of a sublime philosophy even in* India;' for he holds it an incontestable truth, that *a language, which is dead, supposes a nation, which is destroyed*; and he seems to think such reasoning perfectly decisive of the question, without having recourse to astronomical arguments or the spirit of ancient institutions. for my part, I desire no better proof than that, which the language of the *Bráhmans* affords, of an immemorial and total difference between the *Savages of the Mountains*, as the old *Chinese* justly called the *Tartars*, and the studious, placid, contemplative inhabitants of these *Indian* plains.

II. The *geographical* reasoning of M. BAILLY may, perhaps, be thought equally shallow if not inconsistent in some degree with itself. 'An adoration of the sun and of fire, says he, must necessarily have arisen in a cold region: therefore, it must have been foreign to *India*, *Persia*, *Arabia*; therefore, it must have been derived from *Tartary*.' No man, I believe, who has travelled in winter through *Bahàr*, or has even passed a cold season at *Calcutta* within the tropic, can doubt that the solar warmth is often desirable by all, and might have been considered as adorable by the ignorant, in these climates, or that the return of spring deserves all the salutations, which it receives from the *Persian* and *Indian* poets; not to rely on certain historical evidence, that ANTARAH, a celebrated warrior and bard, actually perished with cold on a mountain of *Arabia*. To meet, however, an objection, which might naturally be made to the voluntary settlement, and amazing population, of his primitive race in the icy regions of the north, he takes refuge in the hypothesis of M. BUFFON, who imagines, that our whole globe was at first of a white heat, and has been gradually cooling from the poles to the equator; so that the *Hyperborean* countries had once a delightful temperature, and *Siberia* itself was even *hotter than the climate of our temperate zones*, that is, was in too hot a climate, by his first proposition, for the primary worship of the sun. That the temperature of countries has not sustained a change in the lapse of ages, I will by no means insist; but we can hardly reason conclusively from a variation of temperature to the cultivation and diffusion of science: if as many female elephants and tigresses, as we now find in *Bengal*, had formerly littered in the *Siberian* forests, and if their young, as the earth cooled, had sought a genial warmth in the climates of the south, it would not follow, that other savages, who migrated in the same direction and on the same account, brought religion and philosophy, language and writing, art and science, into the southern latitudes.

We are told by ABU'’ḶGHA'ZI', that the primitive religion of human creatures, or the pure adoration of One Creator, prevailed in *Tartary* during the first generations from YA FET, but was extinct before the birth of OGHU'Z, who restored it in his dominions; that, some ages after him, the *Mongals* and the *Turcs* relapsed into gross idolatry; but that CHENGIZ was a Theist, and, in a conversation with the *Muhammedan* Doctors, admitted their arguments for the being and attributes of the Deity to be unanswerable, while he contested the evidence of their Prophet's legation. From old *Grecian* authorities we. learn, that the *Massagetæ* worshipped the sun; and the narrative of an embassy from JUSTIN to the *Khákàn*, or Emperor, who then resided in a fine vale near the source of the *Irtish*, mentions the *Tartarian* ceremony of purifying the *Roman* Ambassadors by conducting them between two *fires*: the *Tartars* of that age are represented as adorers of the *four elements*, and believers in an invisible spirit, to whom they sacrificed bulls and rams. Modern travellers relate, that, in the festivals of some *Tartarian* tribes, they pour a few drops of a consecrated liquor on the statues of their Gods; after which an attendant sprinkles a little of what remains three times toward the south in honour of fire, toward the west and east in honour of water and air, and as often toward the north in honour of the earth, which contained the reliques of their deceased ancestors : now all this may be very true, without proving a national affinity between the *Tartars* and *Hindus ;* for the *Arabs* adored the planets and the powers of nature, the *Arabs* had carved images, and made libations on a black stone, the *Arabs* turned in prayer to different quarters of the heavens ; yet we know with certainty, that the *Arabs* are a distinct race from the *Tartars ;* and we might as well infer, that they were the same people, because they had each their *Nomades, or wanderers for pasture*, and because the *Turcmans*, described by IBNU ARABSHA'H and by him called *Tátár's*, are, like *most Arabian* tribes, pastoral and warlike, hospitable and generous, wintering and summering on different plains, and rich in herds and flocks, horses and camels ; but this agreement in manners proceeds from the similar nature of their several deserts and their similar choice of a free rambling life, without evincing a community of origin, which they could scarce have had without preserving some remnant at least of a common language.

Many *Lamas*, we are assured, or Priests of BUDDHA, have been found settled in *Siberia ;* but it can hardly be doubted, that the *Lamas* had travelled thither from *Tibet*, whence it is more than probable, that the religion of the *Bauddha's* was imported into southern, or *Chinese*, *Tartary ;* since we know, that rolls of *Tibetian* writing have been brought even from the borders of the *Caspian*. The complexion of BUDDHA himself, which, according to the *Hindus*, was *between white and ruddy*, would perhaps have convinced M. BAILLY, had he known the *Indian* tradition, that the last great legislator and God of the East was a *Tartar ;* but the *Chinese* consider him as a native of *India*, the *Bráhmans* insist, that he was born in a forest near *Gayâ*, and many reasons may lead us to suspect, that his religion was carried from the west and the south to those eastern and northern countries, in which it prevails. On the whole we meet with few or no traces in *Scythia* of *Indian* rites and superstitions, or of that poetical mythology, with which the *Sanscrit* poems are decorated ; and we may allow the *Tartars* to have adored the Sun with more reason than any southern people, without admitting them to have been the sole original inventors of that universal folly : we may even doubt the originality of their veneration for the *four elements*, which forms a pricipal part of the ritual introduced by ZER'ATUSHT, a native of *Rai* in *Persia*, born in the reign of GUSHTASP, whose son PASH'UTEN is believed by the *Pársi's* to have resided long in *Tartary* at a place called *Cangidiz*, where a magnificent place is said to have been built by the father of CYRUS, and where the *Persian* prince, who was a zealot in the new faith, would naturally have disseminated its tenets amount the neighbouring *Tartars*.

Of any Philosophy, except natural Ethics, which the rudest society requires and experience teaches, we find no more vestiges in *Asiatic Scythia* than in ancient *Arabia*; nor would the name of a Philosopher and a *Scythian* have been ever connected, if ANACHARSIS and not visited *Athens* and *Lydia* for that instruction, which his birthplace could not have afforded him; but ANACHARSIS was the son of a *Greecian* woman, who had taught him her language, and he soon learned to despise his own. He was unquestionably a man of a sound understanding and fine parts; and, among the lively sayings, which gained him the reputation of a wit even in *Greece*, it is related by DIOGENES LAERTIUS, that, when an *Athenian* reproached him with being a *Scythian*, he answered: 'my country is, indeed, a disgrace to me, but thou art a disgrace to thy country.' What his country was, in regard to manners and civil duties, we may learn from his fate in it; for when, on his return from *Athens*, he attempted to reform it by introducing the wise laws of his friend SOLON, he was killed on a hunting party with an arrow shot by his own brother, a *Scythian* Chieftain. Such was the philosophy of M. BAILLY'S *Atlantes*, the first and most enlightened of nations! We are assured, however, by the learned author of the *Dabistàn*, that the *Tartars* under CHENGIZ and his descendants were lovers of truth; and would not even preserve their lives by a violation of it: DE GUIGNES ascribes the same veracity, the parent of all virtues, to the *Huns*; and STRABO, who might only mean to lash the *Greeks* by praising Barbarians, as HORACE extolled the wandering *Scythians* merely to satirize his luxurious countrymen, informs us, that the nations of *Scythia* deserved the praise due to wisdom, heroic friendship, and justice; and this praise we may readily allow them on his authority, without supposing them to have been the preceptors of mankind.

As to the laws of ZAMOLXIS, concerning whom we know as little as of the *Scythian* DEUÇALION, or of ABARIS the *Hyperborean*, and to whose story even HERODOTUS gave no credit, I lament, for many reasons, that, if ever they existed, they have not been preserved: it is certain, that a system of laws, called *Yásác*, has been celebrated in *Tartary* since the time of CHENGIZ, who is said to have republished them in his empire, as his institutions were afterwards adopted and enforced by TAIMU'R; but they seem to have been a common, or traditionary, law, and were probably not reduced into writing, till CHENGIZ had conquered a nation, who were able to write.

III. Had the religious opinions and allegorical fables of the *Hindus* being actually borrowed from *Scythia*, travellers must have discovered in that country some ancient monuments of them, such as pieces of grottesque sculture, images of the Gods and *Avatárs*, and inscriptions on pillars or in caverns, analogous to those, which remain in every part of the western peninsula, or to those, which many of us have seen in *Bahàr* and at *Banáras;* but (except a few detached idols) the only great monuments of *Tartarian* antiquity are a line of ramparts on the west and east of the *Caspian*, ascribed indeed by ignorant *Muselmans* to *Yájúj* and *Májúj*, or *Gog* and *Magog*, that is to the *Scythians*, but manifestly raised by a very different nation in order to stop their predatory inroads through the passes of *Caucasus*. The *Chinese* wall was built or finished, on a similar construction and for a similar purpose, by an Emperor, who died only two hundred and ten years before the beginning of our era; and the other mounds were very probably constructed by the old *Persians*, though, like many works of unknown origin, they are given to SECANDER, not the *Macedonian*, but a more ancient Hero supposed by some to have been JEMSHI'D. It is related, that pyramids and tombs have been found in *Tátáristán*, or western *Scythia*, and some remnants of edifices in the lake *Saisan;* that vestiges of a deserted city have been recently discovered by the *Russians* near the *Caspian* sea, and the Mountain of Eagles; and that golden ornaments and utensils, figures of elks and other quadrupeds in metal, weapons of various kinds, and even implements for mining, but made of copper instead of iron, have been dug up in the country of the *Tshúdès;* whence M. BAILLY infers, with great reason, the high antiquity of that people: but the high antiquity of the *Tartars*, and their establishment in that country near four thousand years ago, no man disputes; we are inquiring into their ancient religion and philosophy, which neither ornaments of gold, nor tools of copper, will prove to have had an affinity with the religious rites and the sciences of *India*. The golden utensils might possibly have been fabricated by the *Tartars* themselves; but it is possible too, that they were carried from *Rome* or from *China*, whence occasional embassies were sent to the Kings of *Eighúr*. Towards the end of the tenth century the *Chinese* Emperor dispatched an ambassador to a Prince, named ERSLA'N, which, in the *Turkish* of *Constantinople*, signifies a *lion*, who resided near the Golden Mountain in the same station, perhaps, where the *Romans* had been received in the middle of the sixth century; the *Chinese* on his return home reported the *Eighúris* to be a grave people, with fair complexions, diligent workmen, and ingenious artificers not only in gold, silver, and iron, but in jasper and fine stones; and the *Romans* had before described their magnificent reception in a rich palace adorned with *Chinese* manufactures: but these times were comparatively modern; and, even if we should admit, that the *Eighúris*, who are said to have been governed for a period of two thousand years by an *I'decút*, or soveregin of their own race, were in some very early age a literary and polished nation, it would prove nothing in favour of the *Huns*, *Turcs*, *Mongals*, and other savages to the north of *Pekin*, who seem in all ages, before MUHAMMED, to have been equally ferocious and illiterate.

Without actual inspection of the manuscripts, that have been found near the *Caspian*, it would be impossible to give a correct opinion concerning them; but one of them, described as written on blue silky paper in letters of gold and silver not unlike *Hebrew*, was probably a *Tibetian* composition of the same kind with that, which lay near the source of the *Irtish*, and of which CASSIANO, I believe, made the first accurate version: another, if we may judge from the description of it, was probably modern *Turkish*; and none of them could have been of great antiquity.

IV. From ancient monuments, therefore, we have no proof, that the *Tartars* were themselves well-instructed, much less that they instructed the world; nor have we any stronger reason to conclude from their general manners and character, that they had made an early proficiency in *arts* and *sciences:* even of poetry, the most univeral and most natural of the fine arts, we find no genuine specimens ascribed to them, except some horrible warsongs expressed in *Persian* by ALI´ of *Yezd*, and possibly invented by him. After the conquest of *Persia* by the *Mongals*, their princes, indeed, encouraged learning, and even made astronomical observations at *Samarkand;* as the *Turcs* became polished by mixing with the *Persians* and *Arabs*, though *their very nature*, as one of their own writers confesses, *had before been like an incurable distemper, and their minds clouded with ignorance:* thus also the *Mancheu* monarchs of *China* have been patrons of the learned and ingenious, and the Emperor KIEN-LONG is, if he be now living, a fine *Chinese* poet. In all these instances the *Tartars* have resembled the *Romans*, who, before they had subdued *Greece*, were little better than tigers in war, and *Fauns* or *Sylvans* in science and art.

Before I left *Europe*, I had insisted in conversation, that the *Tuzuc*, translated by Major DAVY, was never written by TAIMU'R himself, at least not as CÆSAR wrote his commentaries, for one very plain reason, that no *Tartarian* king of his age could write at all; and, in support of my opinion, I had cited IBNU ARABSHA'H, who, though justly hostile to the savage, by whom his native city, *Damascus*, had been ruined, yet praises his talents and the real greatness of his mind, but adds: "He was wholly illiterate; he neither read nor wrote any thing; and he knew nothing of *Arabic;* though of *Persian*, *Turkish*, and the *Mogul* dialect, he knew as much as was sufficient for his purpose, and no more: he used with pleasure to hear histories read to him, and so frequently heard the same book, that he was able by memory to correct and inaccurate reader." This passage had no effect on the translator, whom *great and learned men in* India *had assurea*, it seems, *that the work was authentic*, by which he meaned *comosed by the conqueror himself:* but the *great* in this country might have been *unlearned*, or the *learned* might not have been *great* enough to answer any leading question in a manner that opposed the decleared inclination of a *British* inquirer; and, in either case, since no witnesses are named, so general a reference to them will hardly be thought conclusive evidence. On my part, I will name a *Muselman*, whom we all know, and who has enough both of *greatness* and of *learning* to decide the question both impartially and satisfactorily: the *Nawwàb* Mozaffer Jang informed me of his own accord, that no man of sense in *Hindustàn* believed the work to have been composed by Taimu'r, but that his favourite, surnamed Hindu Sha'h, was known to have written that book and others ascribed to his patron, after many confidential discourses with the *Emìr*, and, perhaps, nearly in the Prince's words as well as in his person; a story, which Ali' of *Yezd*, who attended the court of Taimu'r, and has given us a flowery panegyric instead of a history, renders highly probable, by confirming the latter part of the *Arabian* account, and by total silence as to the literary productions of his master. It is true, that a very ingenious but indigent native, whom Davy supported, has given me a written memorial on the subject, in which he mentions Taimu'r as the author of two works in *Tùrkish;* but the credit of his information is overset by a strange apocryphal story of a king of *Yemen*, who invaded, he says, the *Emìr's* dominions, and in whose library the manuscript was afterwards found, and translated by order of Ali'shi'r, first minister of Taimu'r's grandson; and Major Davy himself, before he departed from *Bengal*, told me, that he was greatly perplexed by finding in a very accurate and old copy of the *Tazuc*, which he designed to republish with considerable additions, a particular account, written *unquestionably* by Taimu'r, of *his own death*. No evidence, therefore, has been adduced to shake my opinion, that, the *Moguls* and *Tartars*, before their conquest of *India* and *Persia*, were wholly unlettered; although it may be possible, that, even without art or science, they had, like the *Huns*, both warriors and lawgivers in their own country some centuries before the birth of Christ.

If learning was ever anciently cultivated in the regions to the north of *India*, the seats of it, I have reason to suspect, must have been *Eighùr*, *Cashghar*, *Khatà*, *Chín*, *Tancùt*, and other countries of *Chinese Tartary*, which lie between the thirty-fifth and forty-fith degrees of northern latitude; but I shall, in another discourse, produce my reasons for supposing, that those very countries were peopled by a race allied to the *Hindus*, or enlightened at least by their vicinity to *India* and *China;* yet in *Tancùt*, which by some is annexed to *Tibet*, and even among its old inhabitants, the *Seres*, we have no certain accounts of uncommon talents or great improvements: they were famed, indeed, for the faithful discharge of moral duties, for a pacific disposition, and for that longevity, which is often the reward of patient virtues and a calm temper; but they are said to have been wholly indifferent, in former ages, to the elegant arts and even to commerce; though FADLU'LLAH had been informed, that, near the close of the *thirteenth* century, many branches of natural philosophy were cultivated in *Cam-cheu*, then the metropolis of *Serica*.

We may readily believe those, who assure us, that some tribes of, wandering *Tartars* had real skill in applying herbs and minerals to the purposes of medicine, and pretended to skill in magic; but the general character of their nation seems to have been this: they were professed hunters or fishers, dwelling on that account in forests or near great rivers, under huts or rude tents, or in waggons drawn by their cattle from station to station; they were dextrous archers, excellent horsemen, bold combatants, appearing often to flee in disorder for the sake of renewing their attack with advantage; drinking the milk of mares, and eating the flesh of colts; and thus in many respects resembling the old *Arabs*, but in nothing more than in their love of intoxicating liquors, and in nothing less than in a taste for poetry and the improvement of their language.

Thus has it been proved, and, in my humble opinion, beyond controversy, that the far greater part of *Asia* has been peopled and immemorially possessed by three considerable nations, whom, for want of better names, we may call *Hindus*, *Arabs*, and *Tartars*; each of them divided and subdivided into an infinite number of branches, and all of them so different in form and features, language, manners, and religion, that, if they sprang originally from a common root, they must have been separated for ages: whether more than three primitive stocks can be found, or, in other words, whether the *Chinese*, *Japanese*, and *Persians*, are entirely distinct from them, or formed by their intermixture, I shall hereafter, if your indulgence to me continue, deligently inquire. To what conclusions these inquiries will lead, I cannot yet clearly discern; but, if they lead to truth, we shall not regret our journey through this dark region of ancient history, in which, while we proceed step by step, and follow every glimmering of certain light, that presents itself, we must beware of those false rays and luminous vapours, which mislead *Asiatic* travellers by an apearance of water, but are found on a near approach to be deserts of sand.

III.

THE SIXTH DISCOURSE;

ON THE *PERSIANS*,

DELIVERED 19TH FEBRUARY 1789.

GENTLEMEN,

I TURN with delight from the vast mountains and barren deserts of *Túràn*, over which we travelled last year with no perfect knowledge of our course, and request you now to accompany me on a literary journey through one of the most celebrated and most beautiful countries in the world; a country, the history and languages of which, both ancient and mordern, I have long attentively studied, and on which I may without arrogance promise you more positive information, than I could possibly procure on a nation so disunited and so unlettered as the *Tartars*: I mean that, which *Europeans* improperly call *Persia*, the name of a single province being applied to the whole Empire of *Iràn*, as it is correctly denominated by the present natives of it, and by all the learned *Muselmans*, who reside in these *British* territories. To give you an idea of its largest boundaries agreeably to my former mode of describing *India*, *Arabia*, and *Tartary*, between which it lies, let us begin with the source of the great *Assyrian* stream, *Euphrates*, (as the *Greeks*, according to their custom, were pleased to miscall the *Foràt)* and thence descend to its mouth in the Green Sea, or *Persian Gulf*, including in our line some considerable districts and towns on both sides of the river; then, coasting *Persia*, properly so named, and other *Iranian* provinces, we come to the delta of the *Sindhu* or *Indus*; whence ascending to the mountains of *Cashghar*, we discover its fountains and those of the *Jaihùn*, down which we are conducted to the *Caspian*, which formerly perhaps it entered, though it lose itself now in the sands and lakes of *Khwárezm*: we next are led from the sea of *Khozar*, by the banks of the *Cur*, or *Cyrus*, and along the *Caucasean* ridges, to the shore of the *Euxine*, and thence, by the several *Grecian* seas, o the point, whence we took our departure, at no considerable distance from the *Mediterranean*. We cannot but include the lower *Asia* within this outline, because it was unquestionably a part of the *Persian*, if not of the old *Assyrian*, Empire; for we know, that it was under the dominion of CAIKHOSRAU; and DIODORUS, we find, asserts, that the kingdom of *Troas* was dependent on *Assyria*, since PRIAM implored and obtained succours from his Emperor TEUTAMES, whose name approaches nearer to TAHMU'RAS, than to that of any other *Assyrian* monarch. Thus may we look on *Iràn* as the noblest *Island*, (for so the *Greeks* and the *Arabs* would have called it), or at least as the noblest *peninsula*, on this habitable globe; and if M. BAILLY had fixed on it as the *Atlantis* of PLATO, he might have supported his opinion with far stronger arguments than any, that he has adduced in favour of New *Zembla*: if the account, indeed, of the *Atlantes* be not purely an *Egyptian*, or an *Utopian*, fable, I should be more inclined to place them in *Iràn* than in any region, with which I am acquainted.

It may seem strange, that the ancient history of so distinguished an Empire should be yet so imperfectly known; but very satisfactory reasons may be assigned for our ignorance of it: the principal of them are the superficial knowledge of the *Greeks* and *Jews*, and the loss of *Persian* archives or historical compositions. That the *Grecian* writers, before XENOPHON, had *no* acquaintance with *Persia*, and that *all* their accounts of it are *wholly* fabulous, is a paradox too extravagant to be seriously maintained; but their connection with it in war or peace had, indeed, been generally confined to bordering kingdoms under feudatory princes; and the first *Persian* Emperor, whose life and character they seem to have known with tolerable accuracy, was the great CYRUS, whom I call, without fear of contradiction, CAIKHOSRAU; for I shall then only doubt that the KHOSRAU of FIRDAUSI´ was the CYRUS of the first *Greek* historian, and the Hero of the oldest political and moral romance, when I doubt that LOUIS *Quatorze* and LEWIS *the Fourteenth* were one and the same *French* King: it is utterly incredible, that two different princes of *Persia* should each have been born in a foreign and hostile territory; should each have been doomed to death in his infancy by his maternal grandfather in consequence of portentous dreams, real or invented; should each have been saved by the remorse of his destined murderer, and should each, after a similar education among herdsmen as the son of a herdsman, have found means to revisit his paternal kingdom, and having delivered it, after a long and triumphant war, from the tyrant, who had invaded it, should have restored it to the summit of power and magnificence. Whether so romantic a story, which is the subject of an Epic Poem, as majestic and entire as the *Iliad*, be historically true, we may feel perhaps an inclination to doubt; but it cannot with reason be denied, that the outline of it related to a single Hero, whom the *Asiatics*, conversing with the father of *European* history, described according to their popular traditions by his true name, which the *Greek* alphabet could not express: nor will a difference of names affect the question; since the *Greeks* had little regard for truth, which they *sacrificed* willingly *to the Graces* of their language, and the nicety of their ears; and, if they could render foreign words melodious, they were never solicitous to make them exact; hence they probably formed CAMBYSES from CÁMBAKHSH, or *Granting desires*, a title rather than a name, and XERXES from SHÍRÚYI, a Prince and warrior in the *Sháhnáma*, or from SHÍRSHÁH, which might also have been a title; for the *Asiatic* Princes have constantly assumed new titles or epithets at different periods of their lives, or on different occasions; a custom, which we have seen prevalent in our own times both in *Irán* and *Hindustán*, and which has been a source of great confusion even in the scriptural accounts of *Babylonian* occurrences: both *Greeks* and *Jews* have in fact accommodated *Persian* names to their own articulation; and both seem to have disregarded the native literature of *Irán*, without which they could at most attain a general and imperfect knowledge of the country. As to the *Persians* themselves, who were contemporary with the *Jews* and *Greeks*, they must have been acquainted with the history of their own times, and with the traditional accounts of past ages; but for a reason, which will presently appear, they chose to consider CAYÚMERS as the founder of their empire; and, in the numerous distractions, which followed the overthrow of DÁRÁ, especially in the great revolution on the defeat of YEZDEGIRD, their civil histories were lost, as those of *India* have unhappily been, from the solicitude of the priests, the only depo-

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sitaries of their learning, to preserve their books of law and religion at the expense of all others: hence it has happened, that nothing remains of genuine *Persian* history before the dynasty of SA'SA'N, except a few rustic traditions and fables, which furnished materials for the *Sháhnámah*, and which are still supposed to exist in the *Pahlaví* language. The annals of the *Píshdádì*, or *Assyrian*, race must be considered as dark and fabulous; and those of the *Cayání* family, or the *Medes* and *Persians*, as heroic and poetical; though the lunar eclipses, said to be mentioned by PTOLEMY, fix the time of GUSHTASP, the prince, by whom ZERA'TUSHT was protected: of the *Pàrthian* kings descended from ARSHAC or ARSACES, we know little more than the names; but the *Sásání's* had so long an intercourse with the Emperors of *Rome* and *Byzantium*, that the period of their dominion may be called an historical age. In attempting to ascertain the beginning of the *Assyrian* empire, we are deluded, as in a thousand instances, by names arbitrarily imposed: it had been *settled* by chronologers, that the first monarchy established in *Persia* was the *Assyrian;* and NEWTON, finding some of opinion, that it rose in the first century after the Flood, but unable by his own calculations to extend it farther back than *seven hundred and ninety* years before CHRIST, rejected part of the old system and adopted the rest of it; concluding, that the *Assyrian* Monarchs began to reign about two hundred years after SOLOMON, and that, in all preceding ages, the government of *Iràn* had been divided into several petty states and principalities. Of this opinion I confess myself to have been; when, disregarding the wild chronology of the *Muselmàns* and *Gabrs*, I had allowed the utmost natural duration to the reigns of eleven *Píshdádí* kings, without being able to add more than a hundred years to NEWTON's computation. It seemed, indeed, unaccountably strange, that, although ABRAHAM had found a regular monarchy in *Egypt*, although the kingdom of *Yemen* had just pretensions to very high antiquity, although the *Chinese*, in the twelfth century before our era, had made approaches at least to the present form of their extensive dominion, and although we can hardly suppose the first *Indian* monarchs to have reigned less than three thousand years ago, yet *Persia*, the most delightful, the most compact, the most desirable country of them all, should have remained for so many ages unsettled and disunited. A fortunate discovery, for which I was first indebted to *Mír* MUHAMMED HUSAIN, one of the most intelligent *Muselmàns* in *India*, has at once dissipated the cloud, and cast a gleam of light on the primeval history of *Iràn* and of the human race, of which I had long despaired, and which could hardly have dawned from any other quarter.

The rare and intersting tract *on twelve different religions*, entitled the *Dabistàn*, and composed by a *Mohammedan* traveller, a native of *Cashmìr*, named MOHSAN, but distinguished by the assumed surname of FA'NI', or *Perishable*, begins with a wonderfully curious chapter on the religion of HU'SHANG, which was long anterior to that of ZERA'TUSHT, but had continued to be secretly professed by many learned *Persians* even to the author's time ; and several of the most eminent of them, dissenting in many points from the *Gabrs*, and persecuted by the ruling powers of their country, had retired to *India ;* where they compiled a number of books, now extremely scarce, which MOHSAN had perused, and with the writers of which, or with many of them, he had contracted an intimate friendship : from them he learned, that a powerful monarchy had been established for ages in *Iràn* before the accession of CAYU'MERS, that it was called the *Mahábádian* dynasty for a reason which will soon be mentioned, and that many princes, of whom seven or eight only are named in the *Dabistàn*, and among them MAHBUL, or MAHA' BELI, had raised their empire to the zenith of human glory. If we can rely on this evidence, which to me appears unexceptionable, the *Iranian* monarchy must have been the oldest in the world ; but it will remain dubious, to which of the three stocks, *Hindu*, *Arabian*, or *Tartar*, the first Kings of *Iràn* belonged, or whether they sprang from a *fourth* race distinct from any of the others ; and these are questions, which we shall be able, I imagine, to answer precisely, when we have carefully inquired into the *languages* and *letters*, *religion* and *philophy*, and incidentally into the *arts* and *sciences*, of the ancient *Persians*

I. In the new and important remarks, which I am going to offer, on the ancient *languages* and *characters* of *Ira'n*, I am sensible, that you must give me credit for many assertions, which on this occasion it is impossible to prove ; for I should ill deserve your indulgent attention, if I were to abuse it by repeating a dry list of detached words, and presenting you with a vocabulary instead of a dissertation; but, since I have no system to maintain, and have not suffered imagination to delude my judgement; since I have habituated myself to form opinions of men and things from *evidence*, which is the only solid basis of *civil*, as *experiment* is of *natural*, knowledge; and since I have maturely considered the questions which I mean to discuss; you will not, I am persuaded, suspect my testimony, or think that I go too far, when I assure you, that I will assert nothing positively, which I am not able satisfactorily to demonstrate. When MUHAMMED was born, and ANU´SHI´RAVA´N, whom he calls *the Just King*, sat on the throne of *Persia*, two languages appear to have been generally prevalent in the great empire of *Iràn;* that of the *Court*, thence named *Derì*, which was only a refined and elegant dialect of the *Pársì*, so called from the province, of which *Shíráz* is now the capital, and that of the learned, in which most books were composed and which had the name of *Pahlavì*, either from the *heroes*, who spoke it in former times, or from *Pahlu*, a tract of land, which included, we are told, some considerable cities of *Irák:* the ruder dialects of both were, and, I believe, still are, spoken by the rustics in several provinces; and in many of them, as *Herát*, *Zábul*, *Sístàn* and others, distinct idioms were vernacular, as it happens in every kingdom of great extent. Besides the *Pársì* and *Pahlavì*, a very ancient and abstruse tongue was known to the priests and philosophers, called *the language of the Zend*, because a book on religious and moral duties, which they held sacred, and which bore that name, had been writen in it; while the *Pázend*, or comment on that work, was composed in *Pahlavì*, as a more popular idiom; but a learned follower of ZERA´TUSHT, named BAHMAN, who lately died at *Calcutta*, where he had lived with me as a *Persian* reader about three years, assured me, that the *letters* of his prophet's book were properly called *Zend*, and the *language*, *Avestà*, as the words of the *Véda's* are *Sanscrit*, and the characters, *Nágarì;* or as the old *Saga's* and poems of *Iseland* were expressed in *Runic* letters: let us however, in compliance with custom, give the name of *Zend* to the sacred language of *Persia*, until we can find, as we shall very soon, a fitter appellation for it. The *Zend* and the old *Pahlavì* are almost extinct in *Iràn;* for among six or seven thousand *Gabrs*, who reside chiefly at *Yezd*, and in *Cirmàn*, there are very few, who can read *Pahlavì*, and scarce any, who even boast of knowing the *Zend;* while the *Pársì*, which remains almost pure in the *Sháhnámah,* has now become by the intermixture of numberless *Arabic* words, and many inperceptible changes, a new language exquisitely polished by a series of fine writers in prose and verse, and analogous to the different idioms gradually formed in *Europe* after the subversion of the *Roman* empire: but with modern *Persian* we have no concern in our present inquiry, which I confine to the ages, that preceded the *Mohammedan* conquest. Having twice read the works of FIRDAUSÍ with great attention, since I applied myself to the study of old *Indian* literature, I can assure you with confidence, that hundreds of *Pársì* nouns are pure *Sanscrit*, with no other change than such as may be observed in the numerous *bháshá's*, or vernacular dialects, of *India;* that very many *Persian* imperatives are the roots of *Sanscrit* verbs; and that even the moods and tenses of the *Persian* verb substantive, which is the model of all the rest, are deducible from the *Sanscrit* by an easy and clear analogy: we may hence conclude, that the *Pársì* was derived, like the various *Indian* dialects, from the language of the *Bráhmans;* and I must add, that in the pure *Persian* I find no trace of any *Arabian* tongue, except what proceeded from the known intercourse between the *Persians* and *Arabs*, especially in the time of BAHRAM, who was educated in *Arabia*, and whose *Arabic* verses are still extant, together with his heroic line in *Deri*, which many suppose to be the first attempt at *Persian* versification in *Arabian* metre: but, without having recourse to other arguments, *the composition of words*, in which the genious of the *Persian* delights, and which that of the *Arabic* abhors, is a decisive proof, that the *Pársì* sprang from an *Indian*, and not from an *Arabian*, stock. Considering languages as mere instruments of knowledge, and having strong reasons to doubt the existence of genuine books in *Zend* or *Pahlavì* (especially since the well-informed author of the *Dabistàn* affirms the work of ZERATUSHT to have been lost, and its place supplied by a recent compilation) I had no inducement, though I had an opportunity, to learn what remains of those ancient languages; but I often conversed on them with my friend BAHMAN, and both of us were convinced after full consideration, that the *Zend* bore a strong resemblance to *Sanscrit*, and the *Pahlavì* to *Arabic.* He had at my request translated into *Pahlavì* the fine inscription, exhibited in the *Gulistàn*, on the diadem of CYRUS; and I had the patience to read the list of words from the *Pázend* in the appendix to the *Farhangi Jehángìrì*: this examination gave me perfect conviction, that the *Pahlavi* was a dialect of the *Chaldaic*; and of this curious fact I will exhibit a short proof. By the nature of the *Chaldean* tongue most words ended in the first long vowel like *shemià*, heaven; and that very word, unaltered in a single letter, we find in the *Pázend*, together with *lailià*, night, *meyà*, water, *nírà*, fire, *matrà*, rain, and a multitude of others, all *Arabic* or *Hebrew* with a *Chaldean* termination: so *zamar*, by a beautiful metaphor from *pruning trees*, means in *Hebrew* to *compose verses*, and thence, by an easy transition, to *sing*, them; and in *Pahlavì* we see the verb *zamrúniten*, to *sing*, with its forms *zamrúnemi*, I *sing*, and *zamrúníd*, he *sang*; the verbal terminations of the *Persian* being added to the *Chaldaic* root. Now all those words are integral parts of the language, not adventitious to it like the *Arabic* nouns and verbals engrafted on modern *Persian*; and this distinction convinces me, that the dialect of the *Gabrs*, which they pretend to be that of ZERA'TUSHT, and of which BAHMAN gave me a variety of written specimens, is a late invention of their priests, or subsequent at least to the *Muselman* invasion; for, although it may be possible, that a few of their sacred books were preserved, as he used to assert, in sheets of lead or copper at the bottom of wells near *Yezd*, yet as the conquerors had not only a spiritual, but a political, interest in persecuting a warlike, robust, and indignant race of irreconcilable conquered subjects, a long time must have elapsed, before the hidden scriptures could have been safely brought to light, and few, who could perfectly understand them, must then have remained; but, as they continued to profess among themselves the religion of their forefathers, it became expedient for the *Múbeds* to supply the lost or mutilated works of their legislator by new compositions, partly from their imperfect recollection, and partly from such moral and religious knowledge, as they gleaned, most probably, among the *Christians*, with whom they had an intercourse. One rule we may fairly establish in deciding the question, whether the books of the modern *Gabrs* were anterior to the invasion of the *Arabs*: when an *Arabic* noun occurs in them changed only by the spirit of the *Chaldean* idiom, as *werta*, for *werd*, a rose, *dabà*, for *dhahab*, gold, or *demàn*, for *zemàn*, time, we may allow it to have been ancient *Pahlavì*; but, when we meet with verbal nouns or infinitives, evidently formed by the rules of *Arabian* grammar, we may be sure, that the phrases, in which they occur, are comparatively modern; and not a single passage, which BAHMAN produced from the books of his religion, would abide this test.

We come now to the language of the *Zend*; and here I must impart a discovery, which I lately made, and from which we may draw the most interesting consequences. M. ANQUETIL, who had the merit of undertaking a voyage to *India*, in his earliest youth, with no other view than to recover the writings of ZERA'TUSHT, and who would have acquired a brilliant reputation in *France*, if he had not sullied it by his immoderate vanity and virulence of temper, which alienated the good will even of his own countrymen, has exhibited in his work, entitled *Zendávestà*, two vocabularies in *Zend* and *Pahlavì*, which he had found in an approved collection of *Rawáyát*, or *Traditional Pieces*, in modern *Persian*: of his *Pahlavì* no more needs be said, than that it strongly confirms my opinion concerning the *Chaldaic* origin of that language; but, when I perused the *Zend* glossary, I was inexpressibly surprised to find, that six or seven words in ten were pure *Sanscrit*, and even some of their inflexions formed by the rules of the *Vyácaran*; as *yushmácam*, the genitive plural of *yushmad*. Now M. ANQUETIL most certainly, and the *Persian* compiler most probably, had no knowledge of *Sanscrit*; and could not, therefore, have invented a list of *Sanscrit* words: it is, therefore, an authentic list of *Zend* words, which had been preserved in books or by tradition; and it follows, that the language of the *Zend* was at least a dialect of the *Sanscrit*, approaching perhaps as nearly to it as the *Prácrit*, or other popular idioms, which we know to have been spoken in *India* two thousand years ago. From all these facts it is a necessary consequence, that the oldest discoverable languages of *Persia* were *Chaldaic* and *Sanscrit*; and that, when they had ceased to be vernacular, the *Pahlavì* and *Zend* were deduced from them respectively, and the *Pársì* either from the *Zend*, or immediately from the dialect of the *Bráhmans*; but all had perhaps a mixture of *Tartarain*; for the best lexicographers assert, that numberless words in ancient *Persian* are taken from the language of the *Cimmerians*, or the *Tartars* of *Kipchák*; so that the *three* families, whose lineage we have examined in former discourses, had left visible traces of themselves in *Iràn*, long before the *Tartars* and *Arabs* had rushed from their deserts, and returned to that very country, from which in all probability they originally proceeded, and which the *Hindus* had abandoned in an earlier age, with positive commands from their legislators to revisit it no more. I close this head with observing, that no supposition of a mere political or commercial intercourse between the different nations will account for the *Sanscrit* and *Chaldaic* words, which we find in the old *Persian* tongues; because they are, in the first place, too numerous to have been introduced by such means, and, secondly, are not the names of exotic animals, commodities, or arts, but those of material elements, parts of the body, natural objects and relations, affections of the mind, and other ideas common to the whole race of man.

If a nation of *Hindus*, it may be urged, ever possessed and governed the country of *Iràn*, we should find on the very ancient ruins of the temple or palace, now called *the throne of* JEMSHI'D, some inscriptions in *Dévanágarì*, or at least in the characters on the stones at *Elephanta*, where the sculpture is unquestionably *Indian*, or in those on the *Staff of* FI'RU'Z SHA'H, which exist in the heart of *India;* and such inscriptions we probably should have found, if that edifice had not been erected after the migration of the *Bráhmans* from *Iràn*, and the violent schism in the *Persian* religion, of which we shall presently speak; for, although the popular name of of the building at *Istakhr*, or *Persepolis*, be no certain proof that it was raised in the time of JEMSHI'D, yet such a fact might easily have been preserved by tradition, and we shall soon have abundant evidence, that the temple was posterior to the reign of the *Hindu* monarchs: the *cypresses* indeed, which are represented with the figures in procession, might induce a reader of the *Sháhnámah* to believe, that the sculptures related to the new faith introduced by ZERA'TUSHT; but, as a cypress is a beautiful ornament, and as many of the figures appear inconsistent with the reformed adoration of fire, we must have recourse to stronger proofs, that the *Takhti* JEMSHI'D was erected after CAYU'MERS. The building has lately been visited, and the characters on it examined, by MR. FRANCKLIN; from whom we learn, that NIEBUHR has delineated them with great accuracy: but without such testimony I should have suspected the correctness of the delineation ; because the *Danish* traveller. has exhibited two inscriptions in modern *Persian*, and one of them from the same place, which cannot have been exactly transcribed : they are very elegant verses of NIZA´MI′ and SADI′ *on the instability of human greatness*, but so ill engraved or so ill copied, that, if I had not had them nearly by heart, I should not have been able to read them ; and M. ROUSSEAU of *Isfahàn*, who translated them with shameful inaccuracy, must have been deceived by the badness of the copy ; or he never would have created a new king WAKAM, by forming one word of JEM and the particle prefixed to it. Assuming, however, that we may reason as conclusively on the characters published by NIEBUHR, as we might on the monuments themselves, were they now before us, we may begin with observing, as CHARDIN had observed on the very spot, that they bear no resemblanee whatever to the letters used by the *Gabrs* in their copies of the *Vendidàd :* this I once urged, in an amicable debate with BAHMAN, as a proof, that the *Zend* letters were a modern invention ; but he seemed to hear me without surprise, and insisted, that the letters, to which I alluded, and which he had often seen, were monumental characters never used in books, and intended either to conceal some religious mysteries from the vulgar, or to display the art of the sculptor, like the embellished *Cúfic* and *Nágarì* on several *Arabian* and *Indian* monuments. He wondered, that any man could seriously doubt the antiquity of the *Pahlavì* letters ; and in truth the inscription behind the horse of *Rustam*, which NIEBUHR has also given us, is apparently *Pahlavì*, and might with some pains be decyphered : that character was extremely rude, and seems to have been written, like the *Roman* and the *Arabic*, in a variety of hands ; for I remember to have examined a rare collection of old *Persian* coins in the Museum of the great Anatomist, WILLIAM HUNTER, and, though I believed the legends to be *Pahlavì*, and had no doubt, that they were coins of *Parthian* kings, yet I could not read the inscriptions without wasting more time, than I had then at command, in comparing the letters and ascertaining the proportions,.in which they severally occurred. The gross *Pahlavì* was improved by ZERA´TUSHT or his disciples into an elegant and perspicuous character, in which the *Zendávestà* was copied ; and both were written from the right hand to the left like other *Chaldaic* alphabets ; for they are manifestly both of *Chaldean* origin ; but the *Zend* has the singular advantage of expressing all the long and short vowels, by distinct marks, in the body of each word, and all the words are distinguished by full points between them ; so that, if modern *Persian* were unmixed with *Arabic*, it might be written in *Zend* with the greatest convenience, as any one may perceive by copying in that character a few pages of the *Sháhnámah*. As to the unknown inscriptions in the place of JEMSHI´D, it may reasonably be doubted, whether they contain a system of letters, which any nation ever adopted : in *five* of them the letters, which are separated by points, may be reduced to forty, at least I can distinguish no more essentially different ; and they all seem to be regular variations and compositions of a straight line and an angular figure like the head of a javelin, or a leaf (to use the language of botanists) *hearted and lanced.* Many of the *Runic* letters appear to have been formed of similar elements ; and it has been observed, that the writing at *Persepolis* bears a strong resemblance to that, which the *Irish* call *Ogham :* the word *Agam* in *Sanscrit* means *mysterious knowledge ;* but I dare not affirm, that the two words had a common origin, and only mean to suggest, that, if the characters in question be really alphabetical, they were probably secret and sacerdotal, or a mere cypher, perhaps, of which the priests only had the key. They might, I imagine, be decyphered, if the language were certainly known ; but, in all the other inscriptions of the same sort, the characters are too complex, and the variations of them too numerous, to admit an opinion, that they could be symbols of articulate sounds ; for even the *Nágarì* system, which has more distinct letters than any known alphabet, consists only of forty-nine simple characters, two of which are mere substitutions, and four of little use in *Sanscrit* or in any other language ; while the more complicated figures, exhibited by NIEBUHR must be as numerous at least as the *Chinese* keys, which are the signs of *ideas* only, and some of which resemble the old *Persian* letters at *Istakhr :* the *Danish* traveller was convinced from his own observation, that they were written from the left hand, like all the characters used by *Hindu* nations ; but I must leave this dark subject, which I cannot illuminate, with a remark formerly made by myself, that the square *Chaldaic* letters, a few of which are found on the *Persian* ruins, appear to have been originally the same with the *Dévanágarì*, before the latter were enclosed, as we now see them, angular frames.

II. The primeval religion of *Iràn*, if we rely on the authorities adduced by MOHSANI FA'NI', was that, which NEWTON calls the oldest (and it may justly be called the noblest) of all religions; "a firm belief, that One Supreme GOD made the world by his power, and continually governed it by his providence; a pious fear, love, and adoration of Him; a due reverence for parents and aged persons; a fraternal affection for the whole human species, and a compassionate tenderness even for the brute creation." A system of devotion so pure and sublime could hardly among mortals be of long duration; and we learn from the *Dabistàn*, that the popular worship of the *Iránians* under HU'SHANG was purely *Sabian;* a word, of which I cannot offer any certain etymology, but which has been deduced by grammarians from *Sabà*, a *host*, and, particularly the *host of heaven*, or the *celestial bodies*, in the adoration of which the *Sabian* ritual is believed to have consisted: there is a description, in the learned work just mentioned, of the several *Persian* temples dedicated to the Sun and Planets, of the images adored in them, and of the magnificent processions to them on prescribed festivals, one of which is probably represented by sculpture in the ruined city of JEMSHI´D; but the planetary worship in *Persia* seems only a part of a far more complicated religion, which we now find in these *Indian* provinces; for MOHSAN assures us, that, in the opinion of the best informed *Persians*, who professed the faith of HU'SHANG, distinguished from that of ZERA´TUSHT, the first monarch of *Iràn* and of the whole earth was MAHA´BA´D, a word apparently *Sanscrit*, who divided the people into four orders, the *relious*, the *military*, the *commercial*, and the *servile*, to which he assigned names unquestionably the same in their origin with those now applied to the four primary classes of the *Hindus*. They added, that He received from the creator, and promulgated among men, *a sacred book in a heavenly language*, to which the *Muselman* author gives the *Arabic* title of *desátìr*, or regulations, but the original name of which he has not mentioned; and that *fourteen* MAHA´BA´DS had appeared or would appear in human shapes for the government of this world: now when we know, that the *Hindus* believe in *fourteen* MENU'S, or celestial personages with similar functions, the *first* of whom left a book of *regulations* or *divine* *ordinances*, which they hold equal to the *Véda*, and the language of which they believe to be that of the Gods, we can hardly doubt, that the first corruption of the purest and oldest religion was the system of *Indian* Theology, invented by the *Bráhmans* and prevalent in these territories, where the book of MAHA´BA´D or MENU is at this hour the standard of all religious and moral duties. The accession of CAYU´MERS to the throne of *Persia*, in the eighth or ninth century before CHRIST, seems to have been accompanied by a considerable revolution both in government and religion: he was most probably of a different race from the *Mahábádians*, who preceded him, and began perhaps the new system of national faith, which HU´SHANG, whose name it bears, completed; but the reformation was partial; for, while they rejected the complex polytheism of their predecessors, they retained the laws of MAHA´BA´D, with a superstitious veneration for the sun, the planets, and fire; thus resembling the *Hindu* sects, called *Saura's* and *Ságnica's*, the second of which is very numerous at *Banares* where many *agnihótra's* are continually blazing, and where the *Ságnica's*, when they enter on their sacerdotal office, kindle, with two pieces of the hard wood *Semí*, a fire which they keep lighted through their lives for their nuptial ceremony, the performance of solemn sacrifices, the obsequies of departed ancestors, and their own funeral pile. This remarkable rite was continued by ZERA´TUSHT; who reformed the old religion by the addition of genii, or angels, presiding over months and days, of new ceremonies in the veneration shown to fire, of a new work, which he pretended to have received from heaven, and, above all, by establishing the actual adoration of One Supreme Being: he was born, according to MOHSAN, in the district of *Rai*; and it was He, not, as AMMIANUS asserts, his protector GUSHTASB, who travelled into *India*, that he might receive information from the *Bráhmans* in theology and ethics. It is barely possible, that PYTHAGORAS knew him in the capital of *Irak*; but the *Grecian* sage must then have been far advanced in years, and we have no certain evidence of an intercourse between the two philosophers. The reformed religion of *Persia* continued in force, till that country was subdued by the *Muselmans*; and, without studying the *Zend*, we have ample information concerning it in the modern *Persian* writings of several, who professed it. BAHMAN always named ZERA´TUSHT, with reverence ; but he was in truth a pure Theist, and strongly disclaimed any adoration of the *fire* or other elements : he denied, that the doctrine of two coeval principles, supremely good and supremely bad, formed any part of his faith ; and he often repeated with emphasis the verses of FIRDAUSI on the prostration of CYRUS and his paternal grandfather before the blazing altar : " Think not, that they were adorers of fire ; for that element was only an exalted object, on the lustre of which they fixed their eyes ; they humbled themselves a whole week before GOD ; and, if thy understanding be ever so little exerted, thou must acknowledge thy dependence on the being supremely pure." In a story of SADI, near the close of his beautiful *Bústàn*, concerning the idol of SO'MANA´T'H, or MAHA´DE'VA, he confounds the religion of the *Hindus* with that of the *Gabrs*, calling the *Bráhmans* not only *Moghs*, (which might be justified by a passage in the *Mesnavì)* but even readers of the *Zend* and *Pázend :* now, whether this confusion proceeded from real or pretended ignorance, I cannot decide, but am as firmly convinced, that the doctrines of the *Zend* were distinct from those of the *Véda*, as I am that the religion of the *Bráhmans*, with whom we converse every day, prevailed in *Persia* before the accession of CAYU´MERS, whom the *Pársí's*, from respect to his memory, consider as the first of men, although they believe in *an universal deluge* before his reign.

With the religion of the old *Persians* their *philosophy* (or as much as we know of it) was intimately connected ; for they were assiduous observers of the luminaries, which they adored, and established, according to MOHSAN, who confirms in some degree the fragments of BEROSUS, a number of artificial cycles with distinct names, which seem to indicate a knowledge of the period, in which the equinoxes appear to revolve : they are said also to have known the most wonderful powers of nature, and thence to have acquired the fame of magicians and enchanters ; but I will only detain you with a few remarks on that metaphysical theology, which has been professed immemorially by a numerous sect of *Persians* and *Hindus*, was carried in part into *Greece*, and prevails even now among the learned *Muselmans*, who sometimes avow it without reserve. The modern philosophers of this persuasion are called *Súfi's*, either from the *Greek* word for *a sage*, or from the *woollen* mantle, which they used to wear in some provinces of *Persia:* their fundamental tenets are, that nothing exists absolutely but GOD: that the human soul is an emanation from his essence, and, though divided for a time from its heavenly source, will be finally re-united with it; that the highest possible happiness will arise from its reunion, and that the chief good of mankind, in this transitory world, consists in as perfect an *union* with the Eternal Spirit as the incumbrances of a mortal frame will allow; that, for this purpose, they should break all *connexion* (or *taâlluk*, as they call it), with extrinsic objects, and pass through life without *attachments*, as a swimmer in the ocean strikes freely without the impediment of clothes; that they should be straight and free as the cypress, whose fruit is hardly perceptible, and not sink under a load, like fruit-trees *attached* to a trellis; that, if mere earthly charms have power to influence the soul, the *idea* of celestial beauty must overwhelm it in extatic delight; that, for want of apt words to express the divine perfections and the ardour of devotion, we must borrow such expressions as approach the nearest to our ideas, and speak of *Beauty* and *Love* in a transcendent and mystical sense; that, like a *reed* torn from its native bank, like *wax* separated from its delicious honey, the soul of man bewails its disunion with *melancholy music*, and sheds ourning tears, like the lighted taper, waiting passionately for the moment of its extinction, as a disengagement from earthly trammels, and the means of returning to its Only Beloved. Such in part (for I omit the minuter and more subtil metaphysics of the *Súfi's*, which are mentioned in the *Dabistàn)* is the wild and enthusiastic religion of the modern *Persian* poets, especially of the sweet HA'FIZ and the great *Maulavì:* such is the system of the *Védánti* philosophers and best lyric poets of *India;* and, as it was a system of the highest antiquity in both nations, it may be added to the many other proofs of an immemorial affinity between them.

III. On the ancient *monuments* of *Persian* sculpture and architecture we have already made such observations, as were sufficient for our purpose; nor will you be surprised at the diversity between the figures at *Elephanta*, which are manifestly *Hindu*, and those at *Persepolis*, which are merely *Sabian*, If you concur with me in believing, that the *Takhti Jemshíd* was erected after the time of CAYUMERS, when the *Bráhmans* had migrated from *Irán*, and when their intricate mythology had been superseded by the simpler adoration of the planets and of fire.

IV. As-to the *sciences* or *arts* of the old *Persians*, I have little to say; and no complete evidence of them seems to exist. MOHSAN speaks more than once of ancient verses in the *Pahlavì* language; and BAHMAN assured me, that some scanty remains of them had been preserved: their music and painting, which NIZAMI′ celebrated, have irrecoverably perished; and in regard to MA′NI′, the painter and impostor, whose book of drawings called *Artang*, which he pretended to be divine, is supposed to have been destroyed by the *Chinese*, in whose dominions he had sought refuge, the whole tale is too modern to throw any light on the questions before us concerning the origin of nations and the inhabitants of the primitive world.

Thus has it been proved by clear evidence and plain reasoning, that a powerful monarchy was established in *Iràn* long before the *Assyrian*, or *Píshdádì*, government; that it was in truth a *Hindu* monarchy, though, if any choose to call it *Cusian*, *Casdean*, or *Scythian*, we shall not enter into a debate on mere names; that it subsisted many centuries, and that its history has been ingrafted on that of the *Hindus*, who founded the monarchies of *Ayódhyà* and *Indraprestha*; that the language of the first *Persian* empire was the mother of the *Sanscrit*, and consequently of the *Zend*, and *Parsi*, as well as of *Greek*, *Latin*, and *Gothic*; that the language of the *Assyrians* was the parent of *Chaldaic* and *Pahlavì*, and that the primary *Tartarian* language also had been current in the same empire; although, as the *Tartars* had no books or even letters, we cannot with certainty trace their unpolished and variable idioms. We discover, therefore in *Persia*, at the earliest dawn of history, the *three* distinct races of men, whom we described on former occasions as possessors of *India*, *Arabia*, *Tartary*; and, whether they were collected in *Iràn* from distant regions, or diverged from it, as from a common centre, we shall easily determine by the following considerations. Let us observe in the first place the central position of *Iràn*, which is bounded by *Arabia*, by *Tartary*, and by *India*; whilst *Arabia* lies contiguous to *Iràn* only, but is remote from *Tartary*, and divided even from the skirts of *India* by a considerable gulf; no country, therefore, but *Persia* seems likely to have sent forth its colonies to all the kingdoms of *Asia:* the *Bráhmans* could never have migrated from *India* to *Iràn*, because they are expressly forbidden by their oldest existing laws to leave the region, which they inhabit at this day; the *Arabs* have not even a tradition of an emigration into *Persia* before MOHAMMED, nor had they indeed any inducement to quit their beautiful and extensive domains; and, as to the *Tartars*, we have no trace in history of their departure from their plains and forests, till the invasion of the *Medes*, who, according to etymologists, were the sons of MADAI, and even they were conducted by princes of an *Assyrian* family. The *three* races, therefore, whom we have already mentioned, (and more than three we have not yet found) migrated from *Iràn*, as from their common country; and thus the *Saxon* chronicle, I presume from good authority, brings the first inhabitants of *Britain* from *Armenia;* while a late very learned writer concludes, after all his laborious researches, that the *Goths* or *Scythians* came from *Persia;* and another contends with great force, that both the *Irish* and old *Britons* proceeded severally from the borders of the *Caspian;* a coincidence of conclusions from different media by persons wholly unconnected, which could scarce have happened, if they were not grounded on solid principles. We may therefore hold this proposition firmly established, that *Iràn*, or *Persia* in its largest sense, was the true centre of population, of knowledge, of languages, and of arts; which, instead of travelling westward only, as it has been fancifully supposed, or eastward, as might with equal reason have been asserted, were expanded in all directions to all the regions of the world, in which the *Hindu* race had settled under various denominations: but, whether *Asia* has not produced other races of men, distinct from the *Hindus*, the *Arabs*, or the *Tartars*, or whether any apparent diversity may not have sprung from an intermixture of those three in different proportions, must be the subject of a future inquiry. There is another question of more immediate importance, which you, gentlemen, only can decide: namely, "by what means we can preserve our Society from dying gradually away, as it has advanced gradually to its present (shall I say flourishing or languishing?) state." It has subsisted five years without any expense to the members of it, until the first volume of our Transactions was published; and the price of that large volume, if we compare the different values of money in *Bengal* and in *England*, is not more than equal to the *annual* contribution towards the charges of the Royal Society by each of its fellows, who may not have chosen to compound for it on his admission : this I mention, not from an idea that any of us could object to the purchase of one copy at least, but from a wish to inculcate the necessity of our common exertions in promoting the sale of the work both here and in *London*. In vain shall we meet, as a literary body, if our meetings shall cease to be supplied with original dissertations and memorials ; and in vain shall we collect the most interesting papers, if we cannot publish them occasionally without exposing the Superintendents of the Company's press, who undertake to print them at their own hazard, to the danger of a considerable loss : by united efforts the *French* have compiled their stupendous repositories of universal knowledge ; and by united efforts only can we hope to rival them, or to diffuse over our own country and the rest of *Europe* the lights attainable by our *Asiatic Researches*.

IV.

A LETTER *from the late* HENRY VANSITTART, *Esq.* *To the* PRESIDENT.

SIR,

HAVING some time ago met. with a *Persian* abridgment, composed by *Maulavì* KHAIRU'DDI'N, of the *ásráru'l afághinah*, or the secrets of the *Afghàns*, a book written in the *Pushto* language by HUSAIN, the son of SA´BIR, the son of KHIZR, the disciple of *Hazrat* SHA'H KA´SIM *Sulaimánì*, whose tomb is in *Chunárgur*, I was induced to translate it. Although it opens with a very wild description of the origin of that tribe, and contains a narrative, which can by no means be offered upon the whole as a serious and probable history, yet I conceive, that the knowledge of what a nation suppose themselves to be, may be interesting to a Society like this, as well as of what they really are: indeed the commencement of almost every history is fabulous; and the most enlightened nations, after they have arrived at that degree of civilization and importance, which has enabled and induced them to commemorate their actions, have always found a vacancy at their outset, which invention, or at best presumption, must supply. Such fictions appear at first in the form of traditions; and, having in this shape amused successive generations by a gratification of their national vanity, they are committed to writing, and acquire the authority of history.

As a kingdom is an assemblage of component parts, condensed by degrees, from smaller associations of individuals, to their general union, so history is a combination the of transactions not only of the different tribes, but even of the individuals of the nation, of which it treats: each particular narrative in such a general collection must be summary and incomplete. Biography therefore, as well as descriptions of the manners, actions, and even opinions of such tribes, as are connected with a great kingdom, are not only entertaining in themselves, but useful; as they explain and throw a light upon the history of the nation.

Under these impressions, I venture to lay before the Society the translation of an abridged history of the *Afghàns*, a tribe at different times subject to, and always connected with, the kingdoms of *Persia* and *Hindustàn*. I also submit a specimen of their language, which is called by them *Pukhto;* but this word is softened in *Persian* into *Pushto*.

I am, SIR
With the greatest respect,
Your most obedient humble servant,
HENRY VANSITTART.

Calcutta, March 3, 1784.

On the DESCENT *of the* AFGHANS *from the* JEWS.

THE *Afghàns*, according to their own traditions, are the posterity of MELIC TA'LU'T (king SAUL) who, in the opinion of some, was a descendant of JUDAH, the son of JACOB, and according to others, of BENJAMIN, the brother of JOSEPH.

In a war, which raged between the children of *Israel* and the *Amalekites*, the latter, being victorious, plundered the *Jews*, and obtained possession of the ark of the covenant. Considering this the God of the *Jews*, they threw it into fire, which did not affect it. They afterwards attempted to cleave it with axes, but without success: every individual, who treated it with indignity, was punished for his temerity. They then placed it in their temple, but all their idols bowed to it. At length they fastened it upon a cow, which they turned loose in the wilderness.

When the prophet SAMUEL arose, the children of *Israel* said to him: "we have been totally subdued by the *Amalekites*, and have no king Raise to us a king, that we may be enabled to contend for the glory of God." SAMUEL said: "in case you are led out to battle, are you determined to fight?" They answered: "what has befallen us, that we should not fight against infidels? That nation has banished us from our country and children." At this time the Angel GABRIEL descended, and, delivering a wand, said: "it is the command of GOD, that the person, whose stature shall correspond with this wand, shall be king of *Israel*."

MELIC TA'LU'T was at that time a man of inferior condition, and performed the humble employment of feeding the goats and cows of others. One day a cow under his charge was accidentally lost. Being disappointed in his searches, he was greatly distressed, and applied to SAMUEL, saying, "I have lost a cow, and do not possess the means of satisfying the owner. Pray for me, that I may be extricated from this difficulty." SAMUEL, perceiving that he was a man of lofty stature, asked his name. He answered TA'LU'T. SAMUEL then said: "Measure TA'LU'T with the wand, which the Angel GABRIEL brought." His stature was equal to it. SAMUEL then said: "GOD has raised TA'LU'T to be your king." The children of *Israel* answered: "we are greater than our king. We are men of dignity, and He is of inferior condition. How shall He be our king." SAMUEL informed them, they should know, that God had constituted TA´LU´T their king, by his restoring the ark of the covenant. He accordingly restored it, and they acknowledged him their sovereign.

After TA´LU´T obtained the kingdom, he seized part of the territories of JALU´T, or GOLIAH, who assembled a large army, but was killed by DAVID. TA´LU´T afterwards died a martyr in a war against the infidels; and God constituted DAVID king of the *Jews*.

MELIC TA´LU´T had two sons, one called BERKIA, and the other IRMIA, who sèrved DAVID, and were beloved by him. He sent them to fight against the infidels; and, by GOD'S assistance, they were victorious.

The son of BERKIA was called AFGH`AN, and the son of IRMIA was named USBEC. Those youths distinguished themselves in the reign of DAVID, and were employed by SOLOMON. AFGH`AN was distinguished by his corporal strength, which struck terror into Demons and Genii. USBEC was eminent for his learning.

Afghàn used frequently to make excursions to the mountains; where his progeny, after his death, established themselves, lived in a state of independence, built forts, and exterminated the infidels.

When the select of creatures, MUHAMMED, appeared upon earth, his fame reached the AFGH`ANS, who sought him in multitudes under their leaders KHA´LID and ABDUL RASHI´D, sons of WAL`ID. The prophet honoured them with the most gracious reception, saying: "Come, O *Mulùc*, or Kings;" whence they assumed the title of *Melic*, which they enjoy to this day. The prophet gave them his ensign, and said, that the faith would be strengthened by them.

Many sons were born of KHA´LID, the son of WAL`ID, who signalized themselves in the presence of the prophet, by fighting against the infidels. MUHAMMED honoured and prayed for them.

In the reign of Sultan MAHMU´D of *Ghaznah*, eight men arrived, of the posterity of KHA´LID the son of WAL`ID, whose names were KALUN, ALUN, DAUD, YALUA, AHMED, AWIN, and GHA´ZI´. The Sultan was much pleased with them, and appointed each a commander in his army. He also conferred on them the offices of *Vazir* and *Vakili Mutlak*, or Regent of the Empire.

Wherever they were stationed, they obtained possession of the country, built mosques, and overthrew the temples of idols. They increased so much, that the army of MAHMU´D was chiefly composed of *Afghàns*. When HERHIND, a powerful prince of *Hindustàn*, meditated an invasion of *Ghaznah*, Sultan MAHMU'D dispatched against him the descendants of KHA´LID with twenty thousand horse: a battle ensued; the *Afghans* made the attack; and, after a severe engagement, which lasted from daybreak till noon, defeated HERHIND, killed many of the infidels, and converted some to the *Muhammedan* faith.

The *Afghàns* now began to establish themselves in the mountains; and some settled in cities with the permission of Sultan MAHMU´D. They framed regulations, dividing themselves into four classes, agreeably to the following description. The first is the *pure* class, consisting of those, whose fathers and mothers were *Afghans*. The second class consists of those, whose fathers were *Afghans*, and mothers of another nation. The third class contains those, whose mother were *Afghans*, and fathers of another nation. The fourth class is composed of the children of women, whose mothers were *Afghans*, and fathers and husbands of a different nation. Persons, who do not belong to one of the classes, are not called *Afghans*.

After the death of Sultan MAHMU'D they made another settlement in the mountains. SHIHA´BUDDI´N *Gaurì*, a subsequent Sultan of *Ghaznah*, was twice repulsed from *Hindustan*. His *Vazìr* assembled the people, and asked, if any of the posterity of KHA´LID were living. They answered: "Many now live in a state of independence in the mountains, where they have a considerable army." The *Vazir* requested them to go to the mountains, and by entreaties prevail on the *Afghans* to come; for they were the descendants of companions of the prophet.

The inhabitants of *Ghaznah* undertook this embassy, and, by entreaties and presents, conciliated the minds of the *Afghans*, who promised to engage in the service of the Sultan, provided he would himself come, and enter into an agreement with them. The Sultan visited them in their mountains; honoured them: and gave them dresses and other presents. They supplied him with twelve thousand horse, and a considerable army of infantry. Being dispached by the Sultan before his own army, they took *Dehlì*, killed ROY

PAHTOURA the King, his Ministers and Nobles, laid waste the city, and made the infidels prisoners. They afterwards exhibited nearly the same scene in *Canauj.*

The Sultan, pleased by the reduction of those cities, conferred honours upon the *Afghàns.* It is said, that he then gave them the titles of *Patàn* and *Khàn:* the word *Patàn* is derived from the *Hindi* verb *Paitnà*, to rush, in allusion to their alacrity in attacking the enemy. The *Patans* have greatly distinguished themselves in the history of *Hindustàn*, and are divided into a variety of sects.

The race of *Afghàns* possessed themselves of the mountain of SOLOMON, which is near *Kandahàr*, and the circumjacent country, where they have built forts: this tribe has furnished many kings. The following monarchs of this race have sat upon the throne of *Dehlì:* Sultan *Behlole*, *Afghan* LODÌ, Sultan SECANDER, Sultan IBRÁHÌM, SHÍR SHÀH, ISLÁM SHÀH, ADIL SHÀH SÙR. They also number the following kings of *Gaur:* SOLAIMÀN *Shàh Gurzanì*, BAYAZÌD *Shah*, and KUTB *Shah;* besides whom their nation has produced many conquerors of Provinces. The *Afghans* are called *Solaimánì*, either because they were formerly the subjects of SOLOMON, king of the *Jews*, or because they inhabit the mountain of SOLOMON.

The translation being finished, I shall only add, that the country of the *Afghàns*, which is a province of *Cábul*, was originally called *Roh*, and from hence is derived the name of the *Rohillahs*. The city, which was established in it by the *Afghans*, was called by them *Paishwer*, or *Paishòr*, and is now the name of the whole district. The sects of the *Afghans*, or *Patàns*, are very numerous. The principal are these: *Lodì*, *Lohaunì*, *Sùr*, *Serwánì*, *Yúsufzihì*, *Bangish*, *Dilazaùì*, *Khattì*, *Yasìn*, *Khail*, and *Baloje*. The meaning of *Zihì* is offspring, and of *Khail*, sect. A very particular account of the *Afghans* has been written by the late HÁFIZ RAHMAT *Khàn*, a chief of the *Rohillahs*, from which the curious reader may derive much information. They are *Muselmans*, partly of the *Sunnì*, and partly of the *Shiah* persuation. They are great boasters of the antiquity of their origin, and reputation of their tribe, but other *Muselmans* entirely reject their claim, and consider them of modern, and even base, extraction. However, their character may be collected from history. They have distinguished themselves by their courage, both singly and unitedly, as principals and auxiliaries. They have conquered for their own princes and for foreigners, and have always been considered the main strenth of the army, in which they have served. As they have been applauded for virtues, they have also been reproached for vices, having sometimes been guilty of treachery, and even acted the base part of assassins.

A SPECIMEN *of the* PUSHTO LANGUAGE.

لهستم ظالمان حاکمان
اور کور پیشور دري واره یو دي

By the oppression of tyrannical rulers,
Fire, the grave, and *Patshór*, all three have been rendered equal.

د سنتو پرخمه دی زاغلي روایت

With respect to prayers enjoined by the *Sunnah*, they are remitted.
It is thus expressed in the reports.

کای اوکا دیره شه وی کای نکه هیص پری نوی

If a *man* perform them, it is very laudable. If he do not perform them, it is no crime in him.

میرزاخان

ای میرزا که ذ خوی بهتری نوی
ذ سید تفاوت هه دی له یا منه

If the disposition be not good, *O Mírzà*,
What difference is there between a *Sayyed* and a *Bráhman!*

NOTE *by the* PRESIDENT.

THIS account of the *Afghàns* may lead to a very interesting discovery. We learn from ESDRAS, that the Ten Tribes, after a wandering journey, came to a country called *Arsareth;* where, we may suppose, they settled : now the *Afghàns* are said by the best *Persian* historians to be descended from the *Jews ;* they have traditions among themselves of such a descent; and it is even asserted, that their families are distinguished by the names of *Jewish* tribes, although, since their conversion to the *Islám*, they studiously conceal their origin ; the *Pushto* language, of which I have seen a dictionary, has a manifest resemblance to the *Chaldaic ;* and a considerable district under their dominion is called *Hazáreh*, or *Hazáret*, which might easily have been changed into the word used by ESDRAS. I strongly recommend an inquiry into the literature and history of the *Afghans.*

V.

REMARKS *on the* ISLAND *of* HINZUAN *or* JOHANNA.

By the PRESIDENT.

HINZÚÀN (a name, which has been gradually corrupted into *Anzuame*, *Anjuan*, *Juanny*, and *Johanna)* has been governed about two centuries by a colony of *Arabs*, and exhibits a curious instance of the slow approaches toward civilization, which are made by a small community, with many natural advantages, but with few means of improving them. An account of this *African* island, in which we hear the language and see the manners of *Arabia*, may neither be uninteresting in itself, nor foreign to the objects of inquiry proposed at the institution of our Society.

On *Monday* the 28th of *July* 1783, after a voyage, in the *Crocodile*, of ten weeks and two days from the rugged islands of *Cape Verd*, our eyes were delighted with a prospect so beautiful, that neither a painter nor a poet could perfectly represent it, and so cheering to us, that it can justly be conceived by such only, as have been in our preceding situation. It was the sun-rising in full splendour on the isle of *Mayáta* (as the seamen called it) which we had joyfully distinguished the preceding afternoon by the height of its peak, and which now appeared at no great distance from the windows of our cabin; while *Hinzúàn*, for which we had so long panted, was plainly discernible a-head, where its high lands presented themselves with remarkable boldness. The weather was fair; the water, smooth; and a gentle breeze drove us easily before dinner-time round a rock, on which the *Brilliant* struck just a year before, into a comodious road*, where we dropped our anchor early in the evening; we had seen *Mohíla*, another sister island, in the course of the day.

The frigate was presently surrounded with canoes, and the deck soon crowded with native of all ranks, from the high born chief, who washed linen, to the half-naked slave, who only paddled. Most of them had letters of recommendation from *Englishmen*, which none of them were able to read, though they spoke *English* intelligibly;

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* Lat. 12°. 10 47″. S. Long. 44°. 25′ 5″. E. by the Master.

and some appeared vain of titles, which our countrymen had given them in play, according to their supposed stations: we had *Lords*, *Dukes*, and *Princes* on board, soliciting our custom and importuning us for presents. In fact they were too sensible to be proud of empty sounds, but justly imagined, that those ridiculous titles would serve as marks of distinction, and, by attracting notice, procure for them something substantial. The only men of real consequence in the island, whom we saw before we landed, were the Governor ABDULLAH, second cousin to the king, and his brother ALWI', with their several sons; all of whom will again be particularly mentioned: they understood *Arabic*, seemed zealots in the *Mohammedan* faith, and admired my copies of the *Alkoran;* some verses of which they read, whilst ALWI' perused the opening of another *Arabian* manuscript, and explained it in *English* more accurately than could have been expected.

The next morning showed us the island in all its beauty; and the scene was so diversified, that a distinct view of it could hardly have been exhibited by the best pencil: you must, therefore, be satisfied with a mere description, written on the very spot and compared attentively with the natural landscape. We were at anchor in a fine bay, and before us was a vast amphitheatre, of which you may form a general notion by picturing in your minds a multitude of hill's infinitely varied in size and figure, and then supposing them to be thrown together, with a kind of artless symmetry, in all imaginable positions. The back ground was a series of mountains, one of which is pointed, near half a mile perpendicularly high from the level of the sea, and little more than three miles from the shore: all of them were richly clothed with wood, chiefly fruit-trees, of an exquisite verdure. I had seen many a mountain of a stupendous height in *Wales* and *Swisserland*, but never saw one before, round the bosom of which the clouds were almost continually rolling, while its green summit rose flourishing above them, and received from them an additional brightness. Next to this distant range of hills was another tier, part of which appeared charmingly verdant, and part rather barren; but the contrast of colours changed even this nakedness into a beauty: nearer still were innumerable mountains, or rather cliffs, which brought down their verdure and fertility quite to the beech; so that every shade of green, the sweetest of colours, was displayed at one view by land and by water. But nothing conduced more to the variety of this enchanting prospect, than the many rows of palm-trees, especially the tall and graceful *Areca's*, on the shores, in the valleys, and on the ridges of hills, where one might almost suppose them to have been planted regularly by design. A more beautiful appearance can scarce be conceived, than such a number of elegant palms in such a situation, with luxuriant tops, like verdant plumes, placed at just intervals, and showing between them part of the remoter landscape, while they left the rest to be supplied by the beholder's imagination. The town of *Matsamúdò* lay on our left, remarkable at a distance for the tower of the principal mosque, which was built by HALI'MAH, a queen of the island, from whom the present king is descended: a little on our right was a small town, called *Bantáñi*. Neither the territory of *Nice*, with its olives, date-trees, and cypresses, nor the isles of *Hieres*, with their delightful orange-groves, appeared so charming to me, as the view from the road of *Hinzúàn*; which, nevertheless, is far surpassed, as the Captain of the *Crocodile* assured us, by many of the islands in the southern ocean. If life were not too short for the complete discharge of all our respective duties, public and private, and for the acquisition even of necessary knowledge in any degree of perfection, with how much pleasure and improvement might a great part of it be spent in admiring the beauties of this wonderful orb, and contemplating the nature of man in all its varieties!

We hastened to tread on firm land, to which we had been so long disused, and went on shore, after breakfast, to see the town, and return the Governor's visit. As we walked, attended by a crowd of natives, I surprised them by reading aloud an *Arabic* inscription over the gate of a mosque, and still more, when I entered it, by explaining four sentences, which were written very distinctly on the wall, signifying, "that the world was given us for our own edification, not for the purpose of raising sumptuous buildings; life, for the discharge of moral and religious duties, not for pleasurable indulgences; wealth, to be liberally bestowed, not avaritiously hoarded; and learning, to produce good actions, not empty disputes." We could not but respect the temple even of a false prophet, in which we found such excellent morality: we saw nothing better among the *Romish* trumpery in the church at *Madera*. When we came to ABDULLAH'S house, we were conducted through a small court-yard into an open room, on each side of which was a large and convenient sofa, and above it a high bed-place in a dark recess, over which a chintz counterpoint hung down from the ceiling: this is the general form of the best rooms in the island; and most of the tolerable houses have a similar apartment on the opposite side of the court, that there may be at all hours a place in the shade for dinner or for repose. We were entertained with ripe dates from *Yemen*, and the milk of cocoanuts; but the heat of the room, which seemed accessible to all, who chose to enter it, and the scent of musk or civet, with which it was perfumed, soon made us desirous of breathing a purer air; nor could I be detained long by the *Arabic* manuscripts, which the Governor produced, but which appeared of little use, and consequently of no value, except to such as love mere curiosities: one of them, indeed, relating to the penal law of the *Mohammedans*, I would gladly have purchased at a just price; but he knew not what to ask, and I knew, that better books on that subject might be procured in *Bengal*. He then offered me a black boy for one of my *Alkorans*, and pressed me to barter an *Indian* dress, which he had seen on board the ship, for a cow and calf: the golden slippers attracted him most, since his wife, he said, would like to wear them; and, for that reason, I made him a present of them; but had destined the book and the robe for his superior. No high opinion could be formed of *Sayyad* ABDULLAH, who seemed very eager for gain, and very servile where he expected it.

Our next visit was to *Shaikh* SA'LIM, the king's eldest son; and, if we had seen him first, the state of civilization in *Hinzúàn* would have appeared at its lowest ebb: the worst *English* hackney in the worst stable is better lodged, and looks more princely than this heir apparent; but, though his mien and apparel were extremely savage, yet allowance should have been made for his illness; which, as we afterwards learned, was an abscess in the spleen, a disorder not uncommon in that country, and frequently cured, agreeably to the *Arabian* practice, by the actual cautery. He was incessantly chewing pieces of the *Areca-nut* with shell-lime; a custom borrowed, I suppose, from the *Indians*, who greatly improve the composition with spices and betel-leaves, to which they formerly added camphor: all the natives of rank chewed it, but not, I think, to so great an excess. Prince SA'LIM from time to time gazed at himself with complacency in a piece of broken looking-glass, which was glued on a small board ; a specimen of wretchedness, which we observed in no other house.; but many circumstances convinced us, that the apparently low condition of his royal highness, who was not on bad terms with his father, and seemed not to want authority, proceeded wholly from his avarice. His brother HAMDULLAH, who generally resides in the town of *Domóni*, has a very different character, being esteemed a man of worth, good sense, and learning : he had come, the day before, to *Matsamúdo*, on hearing that an *English* frigate was in the road ; and I, having gone out for a few minutes to read an *Arabic* inscription, found him, on my return, devouring a manuscript, which I had left with some of the company. He is a *Kádí*, or *Mohammedan* judge ; and, as he seemed to have more knowledge than his countrymen, I was extremely concerned, that I had so little conversation with him. The king, *Shaikh* AHMED, has a younger son, named ABDULLAH, whose usual residence is in the town of *Wáni*, which he seldom leaves, as the state of his health is very infirm. Since the succession to the title and authority of *Sultàn* is not unalterably fixed in one line, but requires confirmation by the chiefs of the island, it is not improbable, that they may hereafter be conferred on prince HAMDULLAH.

A little beyond the hole, in which SA LIM received us, was his *haram*, or the apartment of his women, which he permitted us all to see, not through politeness to strangers, as we believed at first, but, as I learned afterwards from his own lips, in expectation of a present: we saw only two or three miserable creatures with their heads covered, while the favourite, as we supposed, stood behind a coarse curtain, and showed her ankles under it loaded with silver rings ; which, if she was capable of reflection, she must have considered as glittering fetters rather than ornaments ; but a rational being would have preferred the condition of a wild beast, exposed to perils and hunger in a forest, to the splendid misery of being wife or mistress to SA'LIM.

Before we returned, ALWI' was desirous of showing me his books ; but the day was too far advanced, and I promised to visit him some other morning. The governor, however, prevailed on us to see his place in the country, where he invited us to dine the next day: the walk was extremely pleasant from the town to the side of a rivulet, which formed in one part a small pool very convenient for bathing, and thence, through groves and alleys, to the foot of a hill; but the dining-room was little better than an open barn, and was recommended only by the coolness of its shade. ABDULLAH would accompany us on our return to the ship, together with two *Mufti's*, who spoke *Arabic* indifferently, and seemed eager to see all my manuscripts; but they were very moderately learned, and gazed with stupid wonder on a fine copy of the *Hamásah* and on other collections of ancient poetry.

Early the next morning a black messenger, with a tawny lad as his interpreter, came from prince SA'LIM; who, having broken his perspective-glass, wished to procure another by purchase or barter: a polite answer was returned, and steps taken to gratify his wishes. As we on our part expressed a desire to visit the king at *Domóni*, the prince's messenger told us, that his master would, no doubt, lend us palanquins (for there was not a horse in the island) and order a sufficient number of his vassals to carry us, whom we might pay for their trouble, as we thought just: we commissioned him, therefore, to ask that favour, and begged, that all might be ready for our excursion before sunrise; that we might escape the heat of the noon, which, though it was the middle of winter, we had found excessive. The boy, whose name was COMBO MADI, stayed with us longer than his companion: there was something in his look so ingenuous, and in his broken *English* so simple, that we encouraged him to continue his innocent prattle. He wrote and read *Arabic* tolerably well, and set down at my desire the names of several towns in the island, which, he first told me, was properly called *Hinzúàn*. The fault of begging for whatever he liked, he had in common with the governor and other nobles; but hardly in a greater degree: his first petition for some lavender-water was readily granted; and a small bottle of it was so acceptable to him, that, if we had suffered him, he would have kissed our feet; but it was not for himself that he rejoiced so extravagantly: he told us with tears starting from his eyes, that his mother would be pleased with it, and the idea of her pleasure seemed to fill him with rapture: never did I see filial affection more warmly felt or more tenderly and, in my opinion, unaffectedly expressed; yet this boy was not a favourite of the officers, who thought him artful. His mother's name, he said, was FA'TIMA ; and he importuned us to visit her ; conceiving, I suppose, that all mankind must love and admire her : we promised to gratify him ; and, having made him several presents, permitted him to return. As he reminded me of ALADDIN in the *Arabian* tale, I designed to give him that name in a recommendatory letter, which he pressed me to write, instead of St. DOMINGO, as some *European* visiter had ridiculously called him ; but, since the allusion would not have been generally known, and since the title of *Aláu'ldìn*, or *Eminence* in *Faith*, might have offended his superiors, I thought it advisable for him to keep his *African* name. A very indifferent dinner was prepared for us at the house of the Governor, whom we did not see the whole day, as it was the beginning of *Ramadàn*, the *Mohammedan* lent, and he was engaged in his devotions, or made them his excuse ; but his eldest son sat by us, while we dined, together with MU'SA, who was employed, jointly with his brother HUSAIN, as purveyor to the Captain of the frigate.

Having observed a very elegant shrub, that grew about six feet high in the court-yard, but was not then in flower, I learned with pleasure, that it was *hinnà*, of which I had read so much in *Arabian* poems, and which *European* Botanists have ridiculously named *Lawsonia* : MU'SA bruised some of the leaves, and, having moistened them with water, applied them to our nails, and the tips of our fingers, which in a short time, became of a dark orange-scarlet. I had before conceived a different idea of this dye, and imagined, that it was used by the *Arabs* to imitate the natural redness of those parts in young and healthy persons, which in all countries must be considered as a beauty : perhaps a less quantity of *hinnà*, or the same differently prepared, might have produced that effect. The old men in *Arabia* used the same dye to conceal their grey hair, while their daughters were dying their lips and gums black, to set off the whiteness of their teeth ; so universal in all nations and ages are personal vanity, and a love of disguising truth ; though in all cases, the farther our species recede from nature, the farther they depart from true beauty ; and men at least should disdain to use artifice or deceit for any purpose or on any occasion : if the women of rank at *Paris*, or those in *London* who wish to imitate them, be inclined to call the *Arabs* barbarians ; let them view their own head-dresses and cheeks in a glass, and, if they have left no room for blushes, be inwardly at least ashamed of their censure.

In the afternoon I walked a long way up the mountains in a winding path amid plants and trees no less new than beautiful, and regretted exceedingly, that very few of them were in blossom ; as I should then have had leisure to examine them. Curiosity led me from hill to hill ; and I came at last to the sources of a rivulet, which we had passed near the shore, and from which the ship was to be supplied with excellent water. I saw no birds on the mountains but *Guinea-fowl*, which might have been easily caught : no insects were troublesome to me, but mosquitos ; and I had no fear of venomous reptiles, having been assured, that the air was too pure for any to exist in it ; but I was often unwillingly a cause of fear to the gentle and harmless lizard, who ran among the shrubs. On my return I missed the path, by which I had ascended ; but, having met some blacks laden with yams and plantains, I was by them directed to another, which led me round, through a charming grove of cocoa-trees, to the Governor's country seat, where our entertainment was closed by a sillabub, which the *English* had taught the *Muselmans* to make for them.

We received no answer from SA´LIM ; nor, indeed, expected one; since we took for granted, that he could not but approve our intention of visiting his father ; and we went on shore before sunrise, in full expectation of a pleasant excursion to *Domóni:* but we were happily disappointed. The servants, at the prince's door, told us coolly, that their master was indisposed, and, as they believed, asleep ; that he had given them no orders concerning his palanquins, and that they durst not disturb him. ALWI´ soon came to pay us his compliments; and was followed by his eldest son, AHMED, with whom we walked to the gardens of the two princes SA´LIM and HAMDULLAH ; the situation was naturally good, but wild and desolate ; and, in SA´LIM'S garden, which we entered through a miserable hovel, we saw a convenient bathing-place, well-built with stone, but then in great disorder, and a shed, by way of summer-house, like that under which we dined at the governor's, but smaller and less neat. On the ground lay a kind of cradle about six feet long, and little more than one foot in breadth, made of cords twisted in a sort of clumsy network, with a long thick bambu fixed to each side of it : this, we heard with surprise, was a royal palanquin, and one of the vehicles, in which we were to have been rocked on men's shoulders over the mountains. I had much conversation with AHMED, whom I found intelligent and communicative: he told me, that several of his countrymen composed songs and tunes; that he was himself a passionate lover of poetry and music; and that, if we would dine at his house, he would play and sing to us. We declined his invitation to dinner; as we had made a conditional promise, if ever we passed a day at *Matsamúdo*, to eat our curry with *Bánà* GIBU, an honest man, of whom we purchased eggs and vegetables, and to whom some *Englishman* had given the title of *lord*, which made him extremely vain: we could, therefore, make *Sayyad* AHMED only a morning visit. He sung a hymn or two in *Arabic*, and accompanied his drawling, though pathetic, psalmody with a kind of mandoline, which he touched with an awkard quill: the instrument was very imperfect, but seemed to give him delight. The names of the strings were written on it in *Arabian* or *Indian* figures, simple and compounded; but I could not think them worth copying. He gave Captain WILLIAMSON, who wished to present some literary curiosities to the library at *Dublin*, a small roll containing a hymn in *Arabic* letters, but in the language of *Mombaza*, which was mixed with *Arabic*; but it hardly deserved examination, since the study of languages has little intrinsic value, and is only useful as the instrument of real knowledge, which we can scarce expect from the poets of the *Mozambique*. AHMED would, I believe, have heard our *European* airs (I always except *French* melody) with rapture, for his favourite tune was a common *Irish* jig, with which he seemed wonderfully affected.

On our return to the beech I thought of visiting old ALWI', according to my promise, and prince SA'LIM, whose character I had not then discovered: I resolved for that purpose to stay on shore alone, our dinner with GIBU having been fixed at an early hour. ALWI' showed me his manuscripts, which chiefly related to the ceremonies and ordinances of his own religion; and one of them, which I had formerly seen in *Europe*, was a collection of sublime and elegant hymns in praise of MOHAMMED, with explanatory notes in the margin: I requested him to read one of them after the manner of the *Arabs*, and he chanted it in a strain by no means unpleasing; but I am persuaded, that he understood it very imperfectly. The room, which was open to the street, was presently crowded with visiters, most of whom were *Mufti's*, or *Expounders of the Law;*

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and ALWI′ desirous, perhaps, to display his zeal before them at the expense of good breeding, directed my atteation to a passage in a commentary on the *Koràn*, which I found levelled at the *Christians*. The commentator, having related with some additions (but, on the whole, not inaccurately) the circumstances of the temptation, puts this speech into the mouth of the tempter : "though I am unable to "delude thee, yet I will mislead, by thy means, more human creatures, than thou wilt set right." 'Nor was this menace vain, (says 'the *Mohammedan* writer) for the inhabitants of a region many 'thousand leagues in extent are still so deluded by the devil, that they 'impiously call I′SA the son of GOD : heaven preserve us, he adds, 'from blaspheming *Christians* as well as blaspheming *Jews*.' Although a religious dispute with those obstinate zealots would have been unseasonable and fruitless, yet they deserved, I thought, a slight reprehension, as the attack seemed to be concerted among them. 'The commentator, said I, was much to blame for passing so indiscriminate and hasty a censure : the title, which gave your legislator, 'and gives you, such offence, was often applied in *Judea*, by a bold 'figure agreeable to the *Hebrew* idiom, though unusual in *Arabic*, to '*angels*, to *holy men*, and even to *all mankind*, who are commanded to 'call GOD *their Father* ; and in this large sense, the Apostle to the '*Romans* calls the elect the *children* of GOD, and the MESSIAH the '*first-born among many brethren* ; but the words *only begotten* are applied transcendently and incomparably to him alone* ; and, as for me, 'who believe the scriptures, which you also profess to believe, though 'you assert without proof that we have altered them, I cannot refuse 'him an appellation, though far surpassing our reason, by which he is 'distinguished in the Gospel ; and the believers in MUHAMMED, who 'expressly names him *the Messiah*, and pronounces him to have been 'born of a virgin, which alone might fully justify the phrase condemned by this author, are themselves condemnable for cavilling at words, 'when they cannot object to the substance of our faith consistently 'with their own.' The *Muselmans* had nothing to say in reply ; and the conversation was changed.

I was astonished at the questions, which ALWI′ put to me concerning the late peace and the independence of *America* ; the several powers and resources of *Britain* and *France*, *Spain* and *Holland* ;

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* Rom. 8. 29. See 1. John 3. 1. II. Barrow, 231, 232, 251.

the character and supposed views of the Emperor ; the comparative strength of the *Russian*, Imperial, and *Othman* armies, and their respective modes of bringing their forces to action : I answered him without reserve, except on the state of our possessions in *India* ; nor were my answers lost ; for I observed, that all the company were variously affected by them ; generally with amazement, often with concern ; especially when I described to them the great force and admirable discipline of the *Austrian* army, and the stupid prejudices of the *Turks*, whom nothing can induce to abandon their old *Tartarian* habits, and exposed the weakness of their empire in *Africa*, and even in the more distant provinces of *Asia*. In return he gave me clear, but general, information concerning the government and commerce of his island : " his country, he said, was poor, " and produced few articles of trade ; but, if they could get money, " *which they now preferred to play things* (those were his words) they " might easily, he added, procure foreign commodities, and exchange " them advantageously with their neighbours in the islands and on " the continent : thus with a little money, said he, we purchase muskets, powder, balls, cutlasses, knives, cloths, raw cotton, and other " articles brought from *Bombay*, and with those we trade to *Madagascar* for the natural produce of the country or for *dollors*, with " which the *French* buy cattle, honey, butter, and so forth, in that island. With *gold*, which we receive from your ships, we can procure " elephants' teeth from the natives of *Mozambique*, who barter them " also for ammunition and bars of iron, and the *Portugueze* in that " country give us cloths of various kinds in exchange for our commodities : those cloths we dispose of lucratively in the three neighbouring islands ; whence we bring rice, cattle, a kind of bread-fruit, " which grows in *Comara*, and *slaves*, which we buy also at other " places, to which we trade ; and we carry on this traffic in our own " vessels."

Here I could not help expressing my abhorrence of their *slave-trade*, and asked him by what law they claimed a property in rational beings ; since our creator had given our species a dominion, to be moderately exercised, over the beasts of the field and the fowls of the air, but none *to man over man*. " By no law, answered " he, unless necessity be a law. There are nations in *Madagascar* " and in *Africa*, who know neither God, nor his Prophet, nor Moses, "nor DAVID, nor the MESSIAH: those nations are in perpetual war, "and take many captives; whom, if they could not sell, they would "certainly kill. Individuals among them are in extreme poverty, "and have numbers of children; who, if they cannot be disposed of, "must perish through hunger, together with their miserable parents: "by purchasing these wretches, we preserve their lives. and, perhaps, "those of many others, whom our money relieves. The sum of the "argument is this · if we buy them, they will live; if they become "valuable servants, they will live comfortably; but, if they are not "sold, they must die miserably." 'There may be, said I, such cases; 'but you fallaciously draw a general conclusion from a few particular 'instances; and this is the very fallacy, which, on a thousand other 'occasions, deludes mankind. It is not to be doubted, that a constant and gainful traffic in human creatures foments war, in which 'captives are always made, and keeps up that perpetual enmity, 'which you pretend to be the *cause* of a practice in itself reprehensible, while in truth it is its *effect;* the same traffic encourages laziness in some parents, who might in general support their families 'by proper industry, and seduces others to stifle their natural feelings: at most your redemption of those unhappy children can 'amount only to a personal contract, implied between you, for gratitude and reasonable service on their part, for kindness and humanity on yours; but can you think your part performed by 'disposing of them against their wills with as much indifference, as 'if you were selling cattle; especially as they might become readers 'of the *Korân,* and pillars of your faith? The law, said he, forbids 'our selling them. when they are belivers in the Prophet; and little 'children only are sold; nor they often, or by all masters.' "You, "who believe in MUHAMMED, said I, are bound by the spirit and "letter of his laws to take pains, that they also may believe in him; "and, if you neglect so important a duty for sordid gain, I do not see "how you can hope for prosperity in this world, or for happiness in "the next." My old friend and the *Mufti's* assented, and muttered a few prayers; but probably forgot my preaching, before many minutes had passed.

So much time had slipped away in this conversation, that I could make but a short visit to prince SA´LIM; and my view in visiting him was to fix the time of our journey to *Domóni* as early as possible on the next morning. His appearance was more savage than ever; and I found him in a disposition to complain bitterly of the *English*: "No acknowledgement, he said, had been made for the kind attentions of himself and the chief men in his country to the officers and "people of the *Brilliant*, though a whole year had elapsed since the "wreck." I really wondered at the forgetfulness, to which alone such a neglect could be imputed; and assured him, that I would express my opinion both in *Bengal* and in letters to *England*. "We have little, said he, to hope from letters; for, when we have "been paid with them instead of money, and have shown them on "board your ships, we have commonly been treated with disdain, "and often with imprecations." I assured him, that either those letters must have been written coldly and by very obscure persons, or shown to very ill-bred men, of whom there were too many in all nations; but that a few instances of rudeness ought not to give him a general prejudice against our national character. "But you, "said he, are a wealthy nation; and we are indigent: yet, though all "our groves of cocoa-trees, our fruits, and our cattle, are ever at "your service, you always try to make hard bargains with us for "what you choose to dispose of, and frequently will neither sell nor "give those things, which we principally want." "To form, said I, "a just opinion of *Englishmen*, you must visit us in our own island, "or at least in *India*; here we are strangers and travellers: many "of us have no design to trade in any country, and none of us think "of trading in *Hinzuàn*, where we stop only for refreshment. The "clothes, arms, or instrument, which you may want, are commonly "necessary or convenient to us; but, if *Sayyad* ALWÍ or his sons "were to be strangers in our country, you would have no reason to "boast of superior hospitality." He then showed me, a second time, a part of an old silk vest with the star of the order of the Thistle, and begged me to explain the motto; expressing a wish, that the order might be conferred on him by the King of *England* in return for his good offices to the *English*. I represented to him the impossibility of his being gratified, and took occasion to say, that there was more true dignity in their own native titles, than in those of *prince*, *duke*, and *lord*, which had been idly given them, but had no conformity to their manners or the constitution of their government.

This conversation being agreeable to neither of us, I changepit by desiring, that the palanquins and bearers might be ready next morning as early as possible: he answered, that his palanquins were at our service for nothing, but that we must pay him ten dollars for each set of bearers; that it was the stated price; and that Mr. HASTINGS had paid it, when he went to visit the king. This, as I learned afterwards, was false; but, in all events, I knew, that he would keep the dollars himself, and give nothing to the bearers, who deserved them better, and whom he would compel to leave their cottages, and toil for his profit. "Can you imagine, I replied, that we would employ four and twenty men to bear us so "far on their shoulders without rewarding them amply? But since "they are free men (so he had assured me) and not your slaves, we "will pay them in proportion to their diligence and good behaviour; and it becomes neither your dignity nor ours to make a previous bargain." I showed him an elegant copy of the *Koràn*, which I destined for his father, and described the rest of my present; but he coldly asked, "if that was all:" had he been king, a purse of dry dollars would have given him more pleasure than the finest or holiest manuscript.. Finding him, in conversing on a variety of subjects, utterly void of intelligence or principle, I took my leave, and saw him no more; but promised to let him know for certain whether we should make our intended excursion.

We dined in tolerable comfort, and had occasion, in the course of the day, to observe the manners of the natives in the middle rank, who are called *Bánas*, and all of whom have slaves constantly at work for them: we visited the mother of COMBOMA'DI, who seemed in a station but little raised above indigence; and her husband, who was a mariner, bartered an *Arabic* treatise on astronomy and navigation, which he had read, for a sea compass, of which he well knew the use.

In the morning I had conversed with two very old *Arabs* of *Yemen*, who had brought some articles of trade to *Hinzuàn*; and in the afternoon I met another, who had come from *Maskat* (where at that time there was a civil war) to purchase, if he could, an hundred stand of arms. I told them all that I loved their nation, and they returned my compliments with great warmth; especially the two old men, who were near fourscore, and reminded me of ZOHAIR and HA'RETH.

So bad an account had been given me of the road over the mountains, that I disuaded my companions from thinking of the journey, to which the Captain became rather disinclined ; but, as I wished to be fully acquainted with a country, which I might never see again, I wrote the next day to SA´LIM, requesting him to lend me one palanquin and to order a sufficient number of men : he sent me no written answer ; which I ascribe rather to his incapacity than to rudeness ; but the Governor, with ALWI´ and two of his sons, came on board in the evening, and said, that they had seen my letter ; that all should be ready ; but that I could not pay less for the men than ten dollars. I said I would pay more, but it should be to the men themselves, according to their behaviour. They returned somewhat dissatisfied, after I had played at chess with ALWI´S younger son, in whose manner and address there was something remarkably pleasing.

Before sunrise on the 2nd of *August* I went alone on shore, with a small basket of such provisions, as I might want in the course of the day, and with some cushions to make the prince's palanquin at least a tolerable vehicle ; but the prince was resolved to receive the dollars, to which his men were entitled ; and he knew, that, as I was eager for the journey, he could prescribe his own terms. Old ALWI´ met me on the beech, and brought excuses from SA´LIM ; who, he said, was indisposed. He conducted me to his house ; and seemed rather desirous of persuading me to abandon my design of visiting the king ; but I assured him, that, if the prince would not supply me with proper attendants, I would walk to *Domóni* with my own servants and a guide. '*Shaikh* SA'LIM, he said, was miserably ava-'ritious ; that he was ashamed of a kinsman with such a disposi-'tion ; but that he was no less obstinate than covetous ; and that, 'without ten dollars paid in hand, it would be impossible to procure 'bearers.' I then gave him three guineas, which he carried, or pretended to carry, to SA´LIM, but returned without the change, alledging that he had no silver, and promising to give me on my return the few dollars that remained. In about an hour the ridiculous vehicle was brought by nine sturdy blacks, who could not speak a word of *Arabic ;* so that I expected no information concerning the country, through which I was to travel ; but ALWI´ assisted me in a point of the utmost consequence. 'You cannot go, said he, without 'an interpreter; for the king speaks only the language of this island; but I have a servant, whose name is TUMU´NI, a sensible and 'worthy man, who understands *English*, and is much esteemed by 'the king: he is known and valued all over *Hinzuán*. This man 'shall attend you; and you will soon be sensible of his worth.'

TUMU´NI desired to carry my basket, and we set out with a prospect of fine weather, but some hours later than I had intended. I walked, by the gardens of the two princes, to the skirts of the town, and came to a little village consisting of several very neat huts made chiefly with the leaves of the cocoa-tree; but the road a little farther was so stony, that I sat in the palanquin, and was borne with perfect safety over some rocks: I then desired my guide to assure the men, that I would pay them liberally; but the poor peasants, who had been brought from their farms on the hills, were not perfectly acquainted with the use of money, and treated my promise with indifference.

About five miles from *Matsamúdo* lies the town of *Wáni*, where *Shaikh* ABDULLAH, who has already been mentioned, usually resides: I saw it at a distance, and it seemed to be agreeably situated. When I had passed the rocky part of the road, I came to a stony beech, where the sea appeared to have lost some ground, since there was a fine sand to the left, and beyond it a beautiful bay, which resembled that of *Weymouth*, and seemed equally convenient for bathing; but it did not appear to me, that the stones, over which I was carried, had been recently covered with water. Here I saw the frigate, and, taking leave of it for two days, turned from the coast into a fine country very neatly cultivated, and consisting partly of hillocks exquisitely green, partly of plains, which were then in a gaudy dress of rich yellow blossoms: my guide informed me, that they were plantations of a kind of vetch, which was eaten by the natives. Cottages and farms were interspersed all over this gay champaign, and the whole scene was delightful; but it was soon changed for beauties of a different sort. We desended into a cool valley, through which ran a rivulet of perfectly clear water; and there, finding my vehicle uneasy, though from the laughter and merriment of my bearers I concluded them to be quite at their ease, I bade them set me down, and walked before them all the rest of the way. Mountains, clothed with fine trees and flowering shrubs, presented themselves on our ascent from the vale; and we proceeded for half an hour through pleasant wood-walks, where I regretted the impossibility of loitering a while to examine the variety of new blossoms, which succeeded one another at every step, and the virtues, as well as names, of which seemed familiar to TUMÚNI. At length we descended into a valley of greater extent than the former: a river or large wintry torrent ran through it, and fell down a steep declibity at the end of it, where it seemed to be lost among rocks. Cattle were grazing on the banks of the river, and the huts of their owners appeared on the hills: a more agreeable spot I had not before seen even in *Swisserland* or *Merionethshire;* but it was followed by an assemblage of natural beauties, which I hardly expected to find in a little island twelve degrees to the south of the Line. I was not sufficiently pleased with my solitary journey to discover charms, which had no actual existence, and the first effect of the contrast between St. *Jago* and *Hinzuàn* had ceased; but, without any disposition to give the landscape a high colouring, I may truly say, what I thought at the time, that the whole country, which next presented itself, as far surpassed *Ermenonville* or *Blenheim*, or any other imitations of nature, which I had seen in *France* or *England*, as the finest bay surpasses an artificial piece of water. Two very high mountains, covered to the summit with the richest verdure, were at some distance on my right hand, and separated from me by meadows diversified with cottages and herds, or by vallies resounding with torrents and water-falls; on my left was the sea, to which there were beautiful openings from the hills and woods; and the road was a smooth path naturally winding through a forest of spicy shrubs, fruit-trees, and palms. Some high trees were spangled with white blossoms equal in fragrance to orange-flowers: my guide called them *Monongo's*, but the day was declining so fast, that it was impossible to examine them: the variety of fruits, flowers, and birds, of which I had a transient view in this magnificent garden, would have supplied a naturalist with amusement for a month; but I saw no remarkable insect, and no reptile of any kind. The woodland was diversified by a few pleasant glades, and new prospects were continually opened: at length a noble view of the sea burst upon me unexpectedly; and, having passed a hill or two, we came to the beech, beyond which were several hills and cottages. We turned from the shore; and, on the next eminence, I saw the town of *Domóni* at a little distance below us: I was met by a number of natives, a few of whom spoke *Arabic*, and thinking it a convenient place for repose, I sent my guide to apprize the king of my intended visit. He returned in half an hour with a polite message; and I walked into the town, which seemed large and populous. A great crowd accompanied me, and I was conducted to a house built on the same plan with the best houses at *Matsamúdo:* in the middle of the court-yard stood a large *Monongo*-tree, which perfumed the air; the apartment on the left was empty; and, in that on the right, sat the king on a sofa or bench covered with an ordinary carpet. He rose, when I entered, and, grasping my hands, placed me near him on the right; but, as he could speak only the language of *Hinzuàn*, I had recourse to my friend TUMÚNI, than whom a readier or more accurate interpreter could not have been found. I presented the king with a very handsome *Indian* dress of blue silk with golden flowers, which had been worn only once at a masquerade, and with a beautiful copy of the *Koràn*, from which I read a few verses to him: he took them with great complacency, and said, "he "wished I had come by sea, that he might have loaded one of my "boats with fruit and with some of his finest cattle. He had seen "me, he said, on board the frigate, where he had been, according "to his custom, in disguise, and had heard of me from his son "*Shaikh* HAMDULLAH." I gave him an account of my journey, and extolled the beauties of his country: he put many questions concerning mine, and professed great regard for our nation. "But "I hear, said he, that you are a magistrate, and consequently "profess peace: why are you armed with a broad sword?" "I "was a man, I said, before I was a magistrate; and, if it should ever "happen, that law could not protect me, I must protect myself." He seemed about sixty years' old, had a very cheerful countenance, and great appearance of good nature mixed with a certain dignity, which distinguished him from the crowd of ministers and officers, who attended him. Our conversation was interrupted by notice, that it was the time for evening prayers; and, when he rose, he said: "this house is yours, and I will visit you in it, after you have “taken some refreshment.” Soon after, his servants brought a roast fowl, a rice-pudding, and some other dishes, with papayas and very good pomegranates: my own basket supplied the rest of my supper. The room was hung with old red cloth, and decorated with pieces of porcelain and festoons of *English* bottles; the lamps were placed on the ground in large sea-shells; and the bed place was a recess, concealed by a chintz hanging, opposite to the sofa, on which we had been sitting: though it was not a place that invited repose, and the gnats were inexpressibly troublesome, yet the fatigue of the day procured me very comfortable slumber. I was waked by the return of the king and his train; some of whom were *Arabs;* for I heard one of them say *huwa rákid* or *he is sleeping:* there was immediate silence, and I passed the night with little disturbance, except from the unwelcome songs of the mosquitos. In the morning all was equally silent and solitary; the house appeared to be deserted; and I began to wonder what had become of TUMU´NI: he came at length with concern on his countenance, and told me, that the bearers had run away in the night; but that the king, who wished to see me in another of his houses, would supply me with bearers, if he could not prevail on me to stay, till a boat could be sent for. I went immediately to the king, whom I found sitting on a raised sofa in a large room, the walls of which were adorned with sentences from the *Koràn* in very legible characters: about fifty of his subjects were seated on the ground in a semicircle before him; and my interpreter took his place in the midst of them. The good old king laughed heartily, when he heard the adventure of the night, and said: “you will now be my “guest for a week, I hope; but seriously if you must return soon. I will send into the country for some peasants to carry you.” He then apologized for the behaviour of *Shaikh* SA´LIM, which he had heard from TUMU´NI, who told me afterwards, that he was much displeased with it, and would not fail to express his displeasure: he concluded with a long harangue on the advantage, which the *English* might derive, from sending a ship every year from *Bombay* to trade with his subjects, and on the wonderful cheapness of their commodities, especially of their cowries. Ridiculous as this idea might seem, it showed an enlargement of mind, a desire of promoting the interest of his people, and a sense of the benefits arising from trade, which could hardly have been expected from a petty *African* chief, and which, if he had been sovereign of *Yemen*, might have been expanded into rational projects proportioned to the extent of his dominions. I answered, that I was imperfectly acquainted with the commerce of *India;* but that I would report the substance of his conversation, and would ever bear testimony to his noble zeal for the good of his country, and to the mildness with which he governed it. As I had no inclination to pass a second night in the island, I requested leave to return without waiting for bearers: he seemed very sincere in pressing me to lengthen my visit, but had too much *Arabian* politeness to be importunate. We, therefore, parted; and, at the request of TUMU'NI, who assured me that little time would be lost in showing attention to one of the worthiest men in *Hinzuán*, I made a visit to the Governor of the town, whose name was MUTEKKA; his manners were very pleasing, and he showed me some letters from the officers of the *Brilliant*, which appeared to flow warm from the heart, and contained the strongest eloge of his courtesy and liberality. He insisted on filling my basket with some of the finest pomegranates I had ever seen; and I left the town, impressed with a very favourable opinion of the king and his governor. When I reascended the hill, attended by many of the natives, one of them told me in *Arabic*, that I was going to receive the highest mark of distinction, that it was in the king's power to show me; and he had scarce ended, when I heard the report of a single gun: *Shaikh* AHMED had saluted me with the whole of his ordnance. I waved my hat, and said *Allah Acbar:* the people shouted, and I continued my journey, not without fear of inconvenience from excessive heat and the fatigue of climbing rocks. The walk, however, was not on the whole unpleasant: I sometimes rested in the valleys and forded all the rivulets, which refreshed me with their coolness, and supplied me with exquisite water to mix with the juice of my pomegranates, and occasionally with brandy. We were overtaken by some peasants, who came from the hills by a nearer way, and brought the king's present of a cow with her calf, and a she-goat with two kids: they had apparently been selected for their beauty, and were brought safe to *Bengal.* The prospects, which had so greatly delighted me the preceding day, had not yet lost their charms, though they wanted the recommendation of novelty; but I must confess, that the most delightful object in that day's walk of near ten miles was the black frigate, which I discerned at sunset from a rock near the Prince's Gardens. Close to the town I was met by a native, who, perceiving me to be weary, opened a fine cocoa-nut, which afforded me a delicious draught: he informed me, that one of his countrymen had been punished that afternoon for a theft on board the *Crocodile*, and added, that, in his opinion, the punishment was no less just, than the offence was disgraceful to his country. The offender, as I afterwards learned, was a youth of a good family, who had married a daughter of old ALWI', but, being left alone for a moment in the cabin, and seeing a pair of blue morocco slippers, could not resist the temptation, and concealed them so ill under his gown, that he was detected with the mainer. This proves, that no principle of honour is instilled by education into the gentry of this island: even ALWI', when he had observed, that, "in the month of "*Ramadán*, it was not lawful to paint with *hinna* or to *tell lies*," and when I asked, whether both were lawful all the rest of the year, answered. that "lies were innocent, if no man was injured by them." TUMU'NI took his leave, as well satisfied as myself with our excursion: I told him, before his master, that I transferred also to him the dollars, which were due to me out of the three guineas; and that, if ever they should part, I should be very glad to receive him into my service in *India*. Mr. ROBERTS, the master of the ship, had passed the day with *Sayyad* AHMED, and had learned from him a few curious circumstances concerning the government of *Hinzuán*; which he found to be a monarchy limited by an aristocracy. The king, he was told, had no power of making war by his own authority; but, if the assembly of nobles, who were from time to time convened by him, resolved on a war with any of the neighbouring islands, they defrayed the charges of it by voluntary contributions, in return for which they claimed as their own all the booty and captives, that might be taken. The hope of gain or the want of slaves is usually the real motive for such enterprises, and ostensible pretexts are easly found: at that very time, he understood, they meditated a war, because they wanted hands for the following harvest. Their fleet consisted of sixteen or seventeen small vessels, which they manned with about two thousand fiive hundred islanders armed with muskets and cutlasses, or with bows and arrows. Near two years before than had possessed themselves of two towns in *Mayáta*, which they still kept and garrisoned. The ordinary expenses of the government were defraved by a tax from two hundred villages; but the three principal towns were exempt from all taxes, except that they paid annually to the Chief *Mufti* a fortieth part of the value of all their moveable property, and from that payment neither the king nor the nobles claimed an exemption. The kingly authority, by the principles of their constitution, was considered as elective, though the line of succession had not in fact been altered since the first election of a Sultan. He was informed, that a wandering *Arab*, who had settled in the island, had, by his intrepidity in several wars, acquired the rank of a chieftain, and afterwards of a king with limited powers; and that he was the *Grand-father* of *Shaikh* AHMED: I had been assured that Queen HALÍMAH was his *Grand-mother;* and, that he was the *sixth* king; but it must be remarked, that the words *jedd* and *jeddah* in *Arabic* are used for a male and female *ancestor* indefinitely; and, without a correct pedigree of AHMED'S family, which I expected to procure but was disappointed, it would scarce be possible to ascertain the time, when his forefather obtained the highest rank in the government. In the year 1600 *Captain* JOHN DAVIS, who wrote an account of his voyage, found *Mayáta* governed by a king, and *Ansuame*, or *Hinzuàn*, by a queen, who showed him great marks of friendship: he anchored before the town of *Demos* (does he mean *Dombni?)* which was as large, he says, as *Plymouth;* and he concludes from the ruins around it, that it had once been a place of strength and grandeur. I can only say, that I observed no such ruins. Fifteen years after, Captain PEYTON and Sir THOMAS ROE touched at the *Comara* islands, and from their several accounts it appears, that an old sultaness then resided in *Hinzuàn*, but had a dominion paramount over all the isles, three of her sons governing *Mohíla* in her name: if this be true, SOHAILÍ and the successors of HALÍMAH must have lost their influence over the other islands; and, by renewing their dormant claim as it suits their convenience, they may always be furnished with a pretence for hostilities. Five generations of eldest sons would account for an hundred and seventy of the years, which have elapsed, since DAVIS and PEYTON found *Hinzuàn* ruled by a sultaness; and AHMED was of such an age, that his reign may be reckoned equal to a generation: it is probable, on the whole, that HALI'MAH was the widow of the first *Arabian* king, and that her mosque has been continued in repair by his descendants ; so that we may reasonably suppose two centuries to have passed, since a single *Arab* had the courage and address to establish in that beautiful island a form of government, which, though bad enough in itself, appears to have been administered with advantage to the original inhabitants. We have lately heard of civil commotions in *Hinzuàn*, which, we may venture to pronounce, were not excited by any cruelty or violence of AHMED, but were probably occasioned by the insolence of an oligarchy naturally hostile to king and people. That the mountains in the *Comara* islands contain diamonds, and the precious metals, which are studiously concealed by the policy of the several governments, may be true, though I have no reason to believe it, and have only heard it asserted without evidence ; but I hope, that neither an expectation of such treasures, nor of any other advantage, will ever induce an *European* power to violate the first principles of justice by assuming the sovereignty of *Hinzuàn*, which cannot answer a better purpose than that of supplying our fleets with seasonable refreshment ; and, although the natives have an interest in receiving us with apparent cordiality, yet, if we wish their attachment to be unfeigned and their dealings just, we must set them an example of strict honesty in the performance of our engagements. In truth our nation is not cordially loved by the inhabitants of *Hinzuàn*, who, as it commonly happens, form a general opinion from a few instances of violence or breach of faith. Not many years ago an *European*, who had been hospitably received and liberally supported at *Matsamúdo*, behaved rudely to a young married woman, who, being of low degree, was walking veiled through a street in the evening : her husband ran to protect her, and resented the rudeness, probably with menaces, possibly with actual force ; and the *European* is said to have given him a mortal wound with a knife or bayonet, which he brought, after the scuffle, from his lodging. This foul murder, which the law of nature would have justified the magistrate in punishing with death, was reported to the king, who told the governor (I use the very words of ALWI´) that "it would be wiser to hush it up." ALWI' mention a civil case of his own, which ought not to be concealed. When he was on the coast of *Africa* in the dominions of a very savage prince, a small *European* vessel was wrecked; and the prince not only seized all that could be saved from the wreck, but claimed the captain and the crew as his slaves, and treated them with ferocious insolence. ALWI´ assured me, that, when he heard of the accident, he hastened to the prince, fell prostrate before him, and by tears and importunity prevailed on him to give the *Europeans* their liberty; that he supported them at his own expense, enabled them to build another vessel, in which they sailed to *Hinzuàn*, and departed thence for *Europe* or *India*: he showed me the Captain's promissory notes for sums, which to an *African* trader must be a considerable object, but which were no price for liberty, safety, and, perhaps, life, which his good, though disinterested, offices had procured. I lamented, that, in my situation, it was wholly out of my power to assist ALWI´ in obtaining justice; but he urged me to deliver an *Arabic* letter from him, enclosing the notes, to the Governor General, who, as he said, knew him well; and I complied with his request. Since it is possible, that a substantial defence may be made by the person thus accused of injustice, I will not name either him or the vessel, which he had commanded; but, if he be living, and if this paper should fall into his hands, he my be induced to reflect how highly it imports our national honour, that a people, whom we call savage, but who administer to our convenience, may have no just cause to reproach us with a violation of our contracts.

VI.

On the BAYA', *or* INDIAN GROSS-BEAK.

By AT'HAR ALÍ KHA'N *of* DELHI.

THE little bird, called *Bayá* in *Hindì*, *Berbera* in *Sanscrit*, *Bábùï* in the dialect of *Bengal*, *Cíbù* in *Persian*, and *Tenawwit* in *Arabic*, from his remarkably *pendent* nest, is rather larger than a sparrow, with yellow-brown plumage, a yellowish head and feet, a light-coloured breast, and a conic beak very thick in proportion to his body. This bird is exceedingly common in *Hindustàn*: he is astonishingly sensible, faithful, and docile, never voluntarily deserting the place where his young were hatched, but not averse, like most other birds, to the society of mankind, and easily taught to perch on the hand of his master. In a state of nature he generally builds his nest on the highest tree, that he can find, especially on the palmyra, or on the *Indian* fig-tree, and he prefers that, which happens to overhang a well or a rivulet: he makes it of grass, which he weaves like cloth and shapes like a large bottle, suspending it firmly on the branches, but so as to rock with the wind, and placing it with its entrance downwards to secure it from birds of prey. His nest usually consists of two or three chambers; and it is the popular belief, that he lights them with fire-flies, which he catches alive at night and confines with moist clay, or with cow-dung: that such flies are often found in his nest, where pieces of cow-dung are also stuck, is indubitable; but, as their light could be of little use to him, it seems probable that he only feeds on them. He may be taught with ease to fetch a piece of paper, or any small thing, that his master points out to him: it is an attested fact, that, if a ring be dropped into a deep well, and a signal given to him, he will fly down with amazing celerity, catch the ring before it touches the water, and bring it up to his master with apparent exultation; and it is confidently asserted, that, if a house or any other place be shown to him once or twice, he will carry a note thither immediately on a proper signal being made. One instance of his docility I can myself mention with confidence, having often been an eye-witness of it: the young *Hindu* women at *Banáres* and in other places wear very thin plates of gold, called *tíca's*, slightly fixed by way of ornament between their eye-brows; and, when they pass through the streets, it is not uncommon for the youthful libertines, who amuse themselves with training *Bayà's*, to give them a sign which they understand, and send them to pluck the pieces of gold from the foreheads of their mistresses, which they bring in triumph to the lovers. The *Bayà* feeds naturally on grass-hoppers and other insects, but will subsist, when tame, on pulse macerated in water: his flesh is warm and drying, of easy digestion, and recommended, in medical books, as a solvent of stone in the bladder or kidneys; but of that virtue there is no sufficient proof. The female lays many beautiful eggs resembling large pearls: the white of them, when they are boiled, is transparent, and the flavour of them is exquisitely delicate. When many *Bayàs* are assembled on a high tree, they make a lively din, but it is rather chirping than singing; their want of musical talents is, however, amply supplied by their wonderful sagacity, in which they are not excelled by any feathered inhabitants of the forest.

VII.

On the CHRONOLOGY *of the* HINDUS.

WRITTEN IN JANUARY 1788,

By the PRESIDENT.

THE great antiquity of the *Hindus* is believed so firmly by themselves, and has been the subject of so much conversation among *Europeans*, that a short view of their Chronological System, which has not yet been exhibited from certain authorities, may be acceptable to those, who seek truth without partiality to receive opinions, and without regarding any consequences, that may result from their inquiries: the consequences, indeed, of truth cannot but be desirable, and no reasonable man will apprehend any danger to society from a general diffusion of its light; but we must not suffer ourselves to be dazzled by a false glare, nor mistake enigmas and allegories for historical verity. Attached to no system, and as much disposed to reject the *Mosaic* history, if it be proved erroneous, as to believe it, if it be confirmed by sound reasoning from indubitable evidence, I propose to lay before you a concise account of *Indian* Chronology extracted from *Sanscrit* books, or collected from conversations with *Pandits*, and to subjoin a few remarks on their system, without attempting to decide a question, which I shall venture to start, "whether it is not in fact the same with our own, but embellished "and obscured by the fancy of their poets and the riddles of their "astronomers."

One of the most curious books in *Sanscrit*, and one of the oldest after the *Véda's*, is a tract on *religious and civil duties*, taken, as it is believed, from the oral instructions of MENU, son of BRAHMÁ, to the first Inhabitants of the earth: a well-collated copy of this interesting law-tract is now before me; and I begin my dissertation with a few couplets from the first chapter of it: "The sun causes the division of day and night, which are of two "sorts, those of men and those of the Gods; the day, for the "labour of *all* creatures in their several employments; the night "for their slumber. A month is a day and night of the Patriarchs; "and it is divided into two parts; the bright half is *their* day for "laborious exertions; the dark half, *their* night for sleep. A year is "a day and night of the Gods; and that is also divided into two "halves; the day is, when the sun moves toward the north; the "night, when it moves toward the south. Learn now the duration of "a night and day of BRAHMA', with that of the ages respectively and "in order. Four thousand years *of the Gods* they call the *Crita*, "(or *Satya)* age; and its limits at the beginning and at the end *are*, "in like manner, as many hundreds. In the three successive ages, "together with their limits at the beginning and end of them, are "thousands and hundreds diminished by one. This aggregate of four "ages, amounting to twelve thousand divine years, is called an age of "the Gods; and a thousand such divine ages added together must "be considered as a day of BRAHMA: his night has also the same "duration. The before-mentioned age of the Gods, or twelve thou"sand of their years, multiplied by seventy-one, form what is named "here below a *Manwantara*. There are *alternate* creations and "destructions *of worlds* through innumerable *Manwantara's:* the "Being Supremely Desirable performs all this again and again."

Such is the arrangement of infinite time, which the *Hindus* believe to have been revealed from heaven, and which they generally understand in a literal sense: it seems to have intrinsic marks of being purely astronomical; but I will not appropriate the observations of others, nor anticipate those in particular, which have been made by two or three of our members, and which they will, I hope, communicate to the Society. A conjecture, however, of Mr. PATERSON has so much ingenuity in it, that I cannot forbear mentioning it here, especially as it seems to be confirmed by one of the couplets just-cited: he supposes, that, as a *month* of mortals is a day and night of the Patriarchs from the analogy of its bright and dark halves, so, by the same analogy, a day and night of mortals might have been considered by the ancient *Hindus* as a month of the lower world; and then a year of such months will consist only of twelve days and nights, and thirty such years will compose a lunar year of mortals; whence he surmises, that the *four million three hundred and twenty thousand* years, of which the four *Indian* ages are supposed to consist, mean only years of twelve days;

and, in fact, that sum, divided by *thirty*, is reduced to *an hundred and forty-four thousand:* now *a thousand four hundred and forty* years are one *pada*, a period in the *Hindu* astronomy, and that sum, multiplied by *eighteen*, amounts precisely to *twenty-five thousand nine hundred and twenty*, the number of years in which the fixed stars appear to perform their long revolution eastward. The last mentioned sum is the product also of *an hundred and forty-four*, which, according to M. BAILLY, was an old *Indian* cycle, into *an hundred and eighty*, or the *Tartarian* period, called *Van*, and of *two thousand eight hundred and eighty* into *nine*, which is not only one of the lunar cycles, but considered by the *Hindus* as a mysterious number and an emblem of Divinity, because, if it be multiplied by any other whole number, the sum of the figures in the different products remains always nine, as the Deity, who appears in many forms, continues One immutable essence. The important period of *twenty-five thousand nine hundred and twenty* years is well known to arise from the multiplication of *three hundred and sixty* into *seventy-two*, the number of years in which a fixed star seems to move through a degree of a great circle; and, although M. LE GENTIL assures us, that the modern *Hindus* believe a complete revolution of the stars to be made in *twenty-four thousand* years, or *fifty-four* seconds of a degree to be passed in one year, yet we may have reason to think, that the old *Indian* astronomers had made a more accurate calculation, but concealed their knowledge from the people under the veil of *fourteen* MENWANTARA'S, *seventy-one* divine ages, compound cycles, and years of different sorts, from those of BRAHMÁ to those of *Pátála*, or the *infernal regions.* If we follow the analogy suggested by MENU, and suppose only a day and night to be called a *year*, we may divide the number of years in a divine age by *three hundred and sixty*, and the quotient will be *twelve thousand*, or the number of his *divine years* in one age: but, conjecture apart, we need only compare the two periods 4320000 and 25920, and we shall find, that among their common divisors, are 6, 9, 12 &c. 18, 36, 72, 144, &c. which numbers with their several multiples, especially in a decuple progression, constitute some of the most celebrated periods of the *Chaldeans, Greeks, Tartars*, and even of the *Indians.* We cannot fail to observe, that the number 432, which appears to be the basis of the *Indian* system, is a 60th part of 25920, and, by continuing the comparison, we might probably solve the whole enigma. In the preface to a *Váránes* Almanac I find the following wild stanza: "A *thousand* Great Ages "are a day of BRAHMA'; a *thousand* such days are an *Indian* hour "of VISHNU; *six hundred thousand* such hours make a period "of RUDRA; and a million of *Rudra's* (or *two quadrillions five hun-*"*dred and ninty-two thousand trillions of lunar years)*, are but a *second* "to the Supreme Being." The *Hindu* theologians deny the conclusion of the stanza to be orthodox: *Time*, they say, *exists not at all with* GOD; and they advise the Astronomers to mind their own business without meddling with theology. The astronomical verse, however, will answer our pesent purpose; for it shows, in the first place, that cyphers are added at pleasure to swell the periods; and, if we take ten cyphers from a *Rudra*,or divide by ten thousand millions, we shall have a period of 259200000 years, which, divided by 60 (the usual divisor of *time* among the *Hindus)* will give 4320000, or a great Age, which we find subdivided in the proportion of 4, 3, 2, 1, from the notion of *virtue* decreasing arithmetically in the *golden*, *silver*, *copper*, and *earthen*, ages. But, should it be thought improbable, that the *Indian* astronomers in very early times had made more accurate observations than those of *Alexandria*, *Bagdád*, or *Marághah*, and still more improbable that they should have relapsed without apparent cause into error, we may suppose, that they formed their divine age by an arbitrary multiplication of 24000 by 180: ccording to M. LE GENTIL, or of 21600 by 200, according to the comment on the *Súrya Siddhánta*. Now, as it is *hardly* possible, that such coincidences should be accidental, we may hold it *nearly* demonstrated, that the period of a *divine age* was at first merely astronomical, and may consequently reject it from our present inquiry into the historical or civil chronology of *India*. Let us, however, preceed to tne avowed opinions of the *Hindus*, and see, when we have ascertained their system, whether we can reconcile it to the course of nature and the common sense of mankind.

The aggregate of their four ages they call a divine age, and believe that, in every thousand such ages, or in every *day* of BRAHMA', *fourteen* MEMU'S are successively invested by him with the sovereignty of the earth: each MENU, they suppose, transmits his empire to his sons and grandsons during a period of seventy-one divine ages ; and such a period they name a *Manwantara ;* but, since *fourteen* multiplied by *seventy-one* are not quite a *thousand*, we must conclude, that *six divine ages* are allowed for intervals between the *Manwantara's*, or for the twilight of BRAHMA´'S day. Thirty such days, or *Calpas*, constitute, in their opinion, *a month* of BRAHMA´ ; twelve such months, one of his years ; and an hundred such years, his *age ;* of which age they assert, that fifty years have elapsed. We are now then, according to the *Hindus*, in the first day or *Calpa* of the first month of the fifty first year of BRAHMA´'S age, and in the twenty-eighth divine age of the seventh *Manwantara*, of which divine age the *three first* human ages have passed, and *four thousand eight hundred and eighty-eight* of the *fourth*.

In the present day of BRAHMA´ the first MENU was surnamed SWA'YAMBHUVA, or *Son of the Self-existent ;* and it is He, by whom the *Institutes of Religious and Civil Duties* are supposed to have been deliverd : in his time the Diety desended at a *Sacrifice*, and, by his wife SATARU´PA´, he had two distinguished sons, and three daughters. This pair was created, for the multiplication of the human species, after that new creation of the world, which the *Bráhmans* call *Pádmacalpíya*, or the *Lotos*-creation.

If it were worth while to calculate the age of MENU'S Institutes, according to the *Bráhmans*, we must multiply four million three hundred and twenty thousand by six times seventy-one, and add to the product the number of years already past in the seventh *Manwantara*. Of the five MENU'S, who succeeded him, I have seen little more than the names ; but the *Hindu* writings are very diffuse on the life and posterity of the *seventh* MENU, surnamed VAIVASWATA, or *Child of the Sun :* he is supposed to have had ten sons, of whom the eldest was ICSHWA´CU ; and to have been accompanied by seven *Rìshi's*, or holy persons, whose names were, CASYAPA, ATRI, VASISHTHA, VISWA'MITRA, GAUTAMA, JAMADAGNI, and BHARÁDWA´JA ; an account, which explains the opening of the fourth chapter of the *Gítà :* "This immutable system of devotion, says "CRISHNA, I revealed to VIVASWAT, *or the Sun ;* VIVASWAT "declared it to *his son* MENU ; MENU explained it to ICSHWA´CU : "thus the Chief *Rìshi's* know this sublime *doctrine* delivered from "one to another."

In the reign of this *Sun-born* Monarch the *Hindus* believe the whole earth to have been drowned, and the whole human race destroyed by a flood, except the pious Prince himself, the seven *Rĭshĭ's*, and their several wives; for they suppose his children to have been born after the deluge. This general *pralaya*, or destruction, is the subject of the first *Purána*, or *Sacred Poem*, which consists of fourteen thousand Stanza's; and the story is concisely, but clearly and elegantly, told in the eighth book of the *Bhágawata*, from which I have extracted the whole, and translated it with great care, but will only present you here with an abridgement of it. "The demon "HAYAGRI'VA having purloined the *Védas* from the custody of "BRAHMA', while he was reposing at the close of the sixth *Man-* "*wantara*, the whole race of men became corrupt, except the seven "*Rĭshĭ's* and SATYAVRATA, who then reigned in *Dravira*, a mari- "time region to the south of *Carnáta:* this prince was performing "his ablutions in the river *Crĭtamálà*, when VISHNU appeared to "him in the shape of a small fish, and, after several augmentations "of bulk in different waters, was placed by SATYAVRATA in the "ocean, where he thus addressed his amazed votary: "In *seven* "days all creatures, who have offended me, shall be destroyed by a "deluge, but thou shalt be secured in a capacious vessel miraculously "formed; take therefore all kinds of medicinal herbs and esculent "grain for food, and, together with the seven holy men, your respec- "tive wives, and pairs of all animals, enter the ark without fear; then "shalt thou know God face to face, and all thy questions shall be "answered." Saying this, he disappeared; and, after seven days, the ocean 'began to overflow the coasts, and the earth to be flooded 'by constant showers, when SATYAVRATA, meditating on the Deity, 'saw a large vessel moving on the waters: he entered it, having in 'all respects conformed to the instructions of VISHNU; who, in the 'form of a vast fish, suffered the vessel to be tied with a great sea- 'serpent, as with a cable, to his measureless horn. When the de- 'luge had ceased, VISHNU slew the demon, and recovered the '*Véda's*, instructed SATYAVRATA in divine knowledge, and appoint- 'ed him the seventh MENU by the name of VAIVASWATA.' Let us compare the two *Indian* accounts of the *Creation* and the *Deluge* with those delivered by MOSES. It is not made a question in this tract, whether the first chapters of *Genesis* are to be understood in a literal, or merely in an allegorical, sense: the only points before us are, whether the creation described by the *first* MENU, which the *Bráhmans* call that of the *Lotos*, be not the same with that recorded in our Scipture, and whether the story of the *seventh* MENU be not one and the same with that of NOAH. I propose the questions, but affirm nothing; leaving others to settle their opinions, whether ADAM be derived from *ádim*, which in *Sanscrit* means the *first*, or MENU from NUH, the true name of the Patriarch; whether the *Sacrifice*, at which GOD is believed to have descended, allude to the offering of ABEL; and, on the whole, whether the two MENUS can mean any other persons than the great progenitor, and the restorer, of our species.

On a supposition, that VAIVASWATA, or *Sun-born*, was the NOAH of Scripture, let us proceed to the *Indian* account of his posterity, which I extract from the *Puránárt'haprecás'a*, or *The Purána's Explained*, a work lately composed in *Sanscrit* by RA'DHA'CA'NTA SARMAN, a *Pandit* of extensive learning and great fame among the *Hindus* of this province. Before we examine the genealogies of kings, which he has collected from the *Purána's*, it will be necessary to give a general idea of the *Avatára's*, or *Descents*, of the Deity: the *Hindus* believe innumerable such descents or special interpositions of providence in the affairs of mankind, but they reckon *ten* principal *Avatára's* in the current period of four ages; and all of them are described, in order as they are supposed to occur, in the following Ode of JAYADE'VA, the great Lyric Poet of *India*.

1. "Thou recoverest the *Véda* in the water of the ocean of des-"truction, *placing it* joyfully in the bosom of an ark fabricated *by* "*thee*; O CE'SAVA, assuming the body of a *fish*: be victorious, O "HERI, lord of the Universe!

2. "The earth stands firm on thy immensely broad back, "which grows larger from the callus occasioned by bearing that "vast burden, O CE'SAVA, assuming the body of a *tortoise*: be "victorious, O HERI, lord of the Universe!

3. "The earth, placed on the point of thy tusk, remains fixed "like the figure of a black antelope on the moon, O CE'SAVA, as-"suming the form of a *boar*: be victorious, O HERI, lord of the "Universe!"

4. The claw with a stupendous point, on the exquisite lotos of thy lion's paw, is the black bee, that stung the body of the em-

bowelled HIRANYACASIPU, O CE'SAVA, assuming the form of a *man-lion:* be victorious, O HERI, lord of the Universe.

5. By thy power thou beguilest BALI, O thou miraculous dwarf, thou purifier of men with the water (of *Gangà)* springing from thy feet, O CE'SAVA, assuming the form of a *dwarf:* be victorious, O HERI, lord of the Universe!

6. Thou bathest in pure water, consisting of the blood of *Cshatriya's*, the world, whose offences are removed and who are relieved from the pain of other births, O CE'SAVA, assuming the form of PARAS'U-RA'MA: be victorious, O HERI, lord of the Universe!

7. With ease to thyself, with delight to the Genii of the eight regions, thou scatterest on all sides in the plain of combat the demon with ten heads, O CE'SAVA, assuming the form of RA'MA-CHANDRA: be victorious, O HERI, lord of the Universe!

8. Thou wearest on thy bright body a mantle shining like a blue cloud, or like the water of *Yamunà* tripping toward thee through fear of thy furrowing *plough share*, O CE'SAVA, assuming the form of BALA-RA'MA: be victorious, O HERI, lord of the Universe!

9. Thou blamest, (oh, wonderful!) the whole *Véda*, when thou seest, O kind-hearted, the slaughter of cattle prescribed for sacrifice, O CE'SAVA, assuming the body of BUDDHA: be victorious, O HERI, lord of the Universe!

10. For the destruction of all the impure thou drawest thy cimeter like a blazing comet, (how tremendous!) O CE'SAVA, assuming the body of CALCI: be victorious, O HERI, lord of the Universe!

These ten *Avatára's* are by some arranged according to the thousands of divine years in each of the four ages, or in an arithmetical proportion from four to one; and, if such an arrangement were universally received, we should be able to ascertain a very material point in the *Hindu* Chronology; I mean the birth of BUDDHA, concerning which the different *Pandits*, whom I have consulted, and the same *Pandits* at different times, have expressed a strange diversity of opinion. They all agree, that CALCI is yet to come, and that BUDDHA was the last considerable incarnation of the Deity; but the Astronomers at *Varánes* place him in the *third* age, and RA'DHA'CA'NT insists, that he appeared after the *thousandth* year of the *fourth:* the learned and accurate author of the *Dabistán*, whose information concerning the *Hindus* is wonderfully correct, mentions an opinion of the *Pandits*, with whom he had conversed, that BUDDHA began his career *ten* years before the close of the third age; and GO'VERDHANA of *Cashmìr*, who had once informed me, that CRISHNA descended *two centuries* before BUDDHA, assured me lately, that the *Cashmirians* admitted an interval of *twenty-four* years (others allow only *twelve)* between those two divine persons. The best authority, after all, is the *Bhágawat* itself, in the first chapter of which it is expressly declared, that "BUDDHA, the son of JINA, would appear at *Cícat'a*, for the purpose of confounding the demons, *just at the beginning* of the *Caliyug*." I have long been convinced, that, on these subjects, we can only reason satisfactorily from *written* evidence, and that our forensic rúle must be invarriably applied, *to take the declarations of the* Bra'hmans *most strongly against themselves*, that is, *against their pretensions to antiquity;* sö that, on the whole, we may safely place BUDDHA *just at the beginning* of the *present* age: but what is the *beginning* of it? When this question was proposed to RA'DHA'CA'NT, he answered: "of a period comprising more than four hundred thousand years, the first two or three thousand may reasonably be called *the beginning*." On my demanding *written* evidence, he produced a book of some authority, composed by a learned *Góswámi*, and entitled *Bhágawatámrita*, or, the *Nectar* of the *Bhágawat*, on which it is a metrical comment; and the couplet, which he read from it deserves to be cited: after the just mentioned account of BUDDHA in the text, the commentator says,

Asau vyactah calérabdasahasradwitayè gatè,
Múrtih pát'alaverná'sya dwibhujà chicurójj'hità.

'He *became* visible, the-thousand-and-second-year-of-the-Cali-*age being* past; his body of-a-colour-between-white-and-ruddy, with-two-arms, without-hair *on his head*.'

Cícat'a, named in the text as the birth place of BUDDHA, the *Góswámi* supposes to have been *Dhermáranya*, a wood near *Gayà*, where a colossal image of that ancient Deity still remains: it seemed to me of black stone; but, as I saw it by torch-light, I cannot be positive as to its colour, which may, indeed, have been changed by time.

The *Bráhmans* universally speak of the *Bauddhas* with all the malignity of an intolerant spirit; yet the most orthodox among them consider BUDDHA himself as an incarnation of VISHNU: this is a contradiction hard to be reconciled; unless we cut the knot, instead of untying it, by supposing with GIORGI, that there were *two* BUDDHAS, the younger of whom established the new religion, which gave so great offence in *India*, and was introduced into *China* in the first century of our era. The *Cashmirian* before mentioned asserted this fact, without being led to it by any question that implied it; and we may have reason to suppose, that *Buddha* is in truth only a general word for a *Philosopher:* the author of a celebrated *Sanscrit* Dictionary, entitled from his name *Amaracósha*, who was himself a *Bauddha*, and flourished in the first century before CHRIST, begins his vocabulary with nine words, that signify *heaven*, and proceeds to those, which mean *a deity in general;* after which come different *classes* of *Gods*, *Demigods*, and *Demons*, all by *generic* names; and they are followed by two very remarkable heads; first, (not the *general names* of BUDDHA, but) the names of a *Buddha-in-general*, of which he gives us eighteen, such as *Muni*, *Sástrí*, *Muníndra*, *Vináyaca*, *Samantabhadra*, *Dhermarája*, *Sugata*, and the like; most of them significative of *excellence*, *wisdom*, *virtue*, and *sanctity;* secondly, the names of a-*particular-Buddha-Muni*-who-descended-in-the-family-of-SA´CYA, (those are the very words of the original) and his titles are, *Sácyamuni*, *Sácyasinha*, *Servárt'hasiddha*, *Saudhódani*, *Gautama*, *Arcabandhu*, or *Kinsman of the Sun*, and *Máyádévísuta*, or *Child of* MA´YA´: thence the author passes to the different epithets of particular *Hindu* Deities. When I pointed out this curious passage to RA´DHA´CA´NT, he contended, that the first eighteen names were *general* epithets, and the following seven, *proper names*, or *patronymics*, of one and the same person; but RA´MALO´CHAN, my own teacher, who, though not a *Bráhman*, is an excellent scholar and a very sensible unprejudiced man, assured me, that *Buddha* was a *generic* word, like *Déva*, and that the learned author, having exhibited the names of a *Dévatà* in general, proceeded to those of a *Buddha* in general, before he came to particulars: he added, that *Buddha* might mean a *Sage* or a *Philosopher*, though *Budha* was the word commonly used for a mere *wise man* without supernatural powers. It seems highly probable, on the whole, that the BUDDHA, whom JAYADE´VA celebrates in his Hymn, was the *Sácyasinha*, or *Lion of* SA´CYA, who, though he forbade the sacrifices of cattle, which the *Véda's* enjoin, was believed to be VISHNU himself in a human form, and that another *Buddha*, one perhaps of his followers in a later age, assuming his name and character, attempted to overset the whole system of the *Bráhmans*, and was the cause of that persecution, from which the *Bauddhas* are known to have fled into very distant regions. May we not reconcile the singular difference of opinion among the *Hindus* as to the time of BUDDHA'S appearance, by supposing that they have confounded the *Two Buddhas*, the first of whom was born a few years before the close of the last age, and the second, when above a thousand yeas of the present age had elapsed? We know, from better authorities, and with as much certainty as can justly be expected on so doubtful a subject, the real time, compared with our own era, when the ancient BUDDHA began to distinguish himself; and it is for this reason principally, that I have dwelled with minute anxiety on the subject of the last *Avatàr*.

The *Bráhmans*, who assisted ABU'LFAZL in his curious, but superficial, account of his master's Empire, informed him, if the figures in the *Ayíni Acbarì* be correctly written, that a period of 2962 years had elapsed from the birth of BUDDHA to the 40th year of ACBAR'S reign, which computation will place his birth in the 1366th year before that of our Saviour; but, when the *Chinese* government admitted a new religion from *India* in the first century of our era, they made particular inquiries concerning the age of the old *Indian* BUDDHA, whose birth, according to COUPLET, they place in the 41st year of their 28th cycle, or 1036 years before CHRIST, and they call him, says he, FOE the son of MOYE or MA´YA´; but M. DE GUIGNES, on the authority of four *Chinese* Historians, asserts, that FO was born about the year before CHRIST 1027, in the kingdom of *Cashmír*: GIORGI, or rather CASSIANO, from whose papers his work was compiled, assures us, that, by the calculation of the *Tibetians*, he appeared only 959 years before the *Christian* epoch; and M. BAILLY, with some hesitation, places him 1031 years before it, but inclines to think him far more ancient, confounding him, as I have done in a former tract, with the *first* BUDHA, or MERCURY, whom the *Goths* called WODEN, and of whom I shall presently take particular notice. Now, whether we assume the medium of the four last-mentioned dates, or implicitly rely on the authorities quoted by DE GUIGNES, we may conclude, that BUDDHA was first distinguished in this country *about a thousand* years before the beginning of our era; and whoever, in so early an age, expects a certain epoch unqualified with *about* or *nearly*, will be greatly disappointed. Hence it is clear, that, whether the fourth age of the *Hindus* began about *one* thousand years before CHRIST, according to GOVERDHAN'S account of BUDDHA'S birth, or *two* thousand, according to that of RA´DHA´CA´NT, the common opinion, that 4888 years of it are now elapsed, is erroneous; and here for the present we leave BUDDHA, with an intention of returning to him in due time; observing only, that, if the learned *Indians* differ so widely in their accounts of the age, when their ninth *Avatàr* appeared in their country, we may be assured, that they have no certain Chronology before him, and may suspect the certainty of all the relations concerning even *his* appearance.

The received Chronology of the *Hindus* begins with an absurdity so monstrous, as to overthrow the whole system; for, having established their period of *seventy-one divine ages* as the reign of each *Menu*, yet thinking it incongruous to place a holy personage in times of *impurity*, they insist, that the *Menu* reigns only in every *golden* age, and disappears in the *three human ages* that follow it, continuing to dive and emerge, like a waterfowl, till the close of his *Manwantara*: the learned author of the *Puránárt'hapracása*, which I will now follow step by step, mentioned this ridiculous opinion with a serious face; but, as he has not inserted it in his work, we may take his account of the seventh *Menu* according to its obvious and rational meaning, and suppose, that VAIVASWATA, the son of SU´RYA, the son of CASYAPA, or *Uranus*, the son of MARI´CHI, or *Light*, the son of BRAHMA´, which is clearly an allegorical pedigree, reigned in the last golden age, or, according to the *Hindus*, three million eight hundred and ninety-two thousand eight hundred and eighty-eight years ago. But they contend, that he actually reigned on earth *one million seven hundred and twenty-eight thousand* years of mortals, or *four thousand eight hundred* years of the Gods; and this opinion is another monster so repugnant to the course of nature and to human reason, that it must be rejected as wholly fabulous, and taken as a proof, that the *Indians* know nothing of their *Sun*-

born MENU, but his name and the principal event of his life; I mean the *universal deluge*, of which the *three* first *Avatàrs* are merely allegorical representations, with a mixture, especially in the *second*, of astronomical Mythology.

From this MENU the whole race of men is believed to have descended; for the seven *Rĭshi's*, who were preserved with him in the ark, are not mentioned as fathers of human families; but, since his daughter ILÁ was married, as the *Indians* tell us, to the first BUDHA, or *Mercury*, the son of CHANDRA, or the *Moon*, a male Deity, whose father was ATRI, son of BRAHMÁ, (where again we meet with an allegory purely astronomical or poeitical) his posterity are divided into two great branches, called the *Children of the Sun* from his own supposed father, and the *Children of the Moon*, from the parent of his daughter's husband: the lineal male descendants in both these families are supposed to have reigned in the cities of *Ayódhyà*, or *Audh*, and *Pratisht'hána*, or *Vĭtóra*, respectively till the *thousandth year of the present age*, and the names of all the princes in both lines having been diligently collected by RÁDHÁCÁNT from several *Purána's* I exhibit them in two columns arranged by myself with great attention.

SECOND AGE.

CHILDREN OF THE

	SUN.	MOON.	
	ICSHWÁCU,	BUDHA,	
	Vicucshi,	*Pururavas,*	
	Cucutst'ha,	Ayush,	
	Anénas,	Nahusha,	
5.	*Prĭt'hu,*	*Yayáti,*	5.
	Vis´wagandhi,	*Puru,*	
	Chandra,	Janaméjaya,	
	Yuvanás´wa,	Prachinwat,	
	Sráva,	Pravíra,	
10.	Vrihadas´wa,	Menasyu,	10.
	Dhundhumára,	Chárupada,	
	Drĭd"hás´wa.	Sudyu,	
	Heryas´wa,	Bahugava,	

CHILDREN OF THE

	SUN.	MOON.	
	Nićumbha,	Sańyáti,	
15.	Crĭs'ás'wa,	Ahańyáti,	15.
	Sénajit,	Raudrás'wa,	
	Yuvanás'wa,	Rĭtéyush,	
	Mándhátrĭ,	Rantináva,	
	Purucutsa,	Sumati,	
20.	Trasadasyu,	Aiti,	20.
	Anaranya,	*Dushmanta*,	
	Heryas wa,	*Bharata*,*	
	Praruna,	(Vitat'ha,	
	Trivindhana,	Manyu,	
25.	Satyavrata,	Vrĭhatcshétra,	25.
	Tris'ancu,	Hastin,	
	Haris'chandra,	Ajamid ha,	
	Róhita,	Rĭcsha,	
	Harita,	Samwarana,	
30.	Champa,	*Curu*,	30.
	Sudéva,	*Jahnu*,	
	Vijaya,	Surat'ha,	
	Bharuca,	Vidúrat'ha,	
	Vrĭca,	Sárvabhauma,	
35.	Báhuca,	Jayatséna,	35.
	Sagara,	Rádhica,	
	Asamanjas,	Ayutáyush,	
	Ans'umat,	Acródhana,	
	Bhagĭrat'ha,	Dévátit'hi,	
40.	Sruta,	Rĭcsha,	40.
	Nábha,	*Dilĭpa*,	
	Sindhudwípa,	Pratípa,	
	Ayutáyush,	Sántanu,	
	Rĭtaperna,	*Vichitravĭrya*,	
45.	Saudása.	Pándu,	45.
	As'maca,	*Yudhisht'hir*),	
	Múlaca,		
	Das'arat'ha,		
	Aíd'abid'i,		

CHILDREN OF THE

SUN.	MOON.
50. Vis'wasaha,	
C'hátwánga,	
Dírghabáhu,	
Raghu,	
Aja,	
55. *Das'arat'ha*,	
RA'MA.	

It is agreed among all the *Pandits*, that RA'MA, their *seventh* incarnate Divinity, appeared as king of *Ayódhyà* in the *interval* between the *silver* and the *brazen* ages; and, if we suppose him to have begun his reign at the very beginning of that interval, still *three thousand three hundred* years of the Gods, or *a million one hundred and eighty-eight thousand* lunar years of mortaſs will remain in the *silver* age, during which the *fifty-five* princes between VAIVASWATA and RA'MA, must have governed the world; but, reckoning *thirty* years for a generation, which is rather too much for a long succession of *eldest* sons, as they are said to have been, we cannot, by the course of nature, extend the *second* age of the *Hindus* beyond *sixteen hundred and fifty* solar years: if we suppose them not to have been eldest sons, and even to have lived longer than modern princes in a dissolute age, we shall find only a period of *two thousand* years; and, if we remove the difficulty by admitting miracles, we must cease to reason, and may as well believe at once whatever the *Bráhmans* choose to tell us.

In the *Lunar* pedigree we meet with another absurdity equally fatal to the credit of the *Hindu* system: as far as the twenty-second degree of descent from VAIVASWATA the synchronism of the two families appears tolerably regular, except that the Children of the Moon were not all *eldest* sons; for king YAYA'TI appointed the youngest of his five sons to succeed him in *India*, and allotted inferior kingdoms to the other four, who had offended him; part of the *Dacshin* or the *South*, to YADU, the ancestor of CRISHNA; the north, to ANU; the east, to DRUHYA; and the west, to TURVASU, from whom the *Pandits* believe, or pretend to believe, in compliment to our nation, that we are descended. But of the subsequent degrees in the lunar line they know so little, that, unable to supply a considerable interval between BHARAT and VITAT'HA, whom they call his son and successor, they are under a necessity of asserting, that the great ancestor of YUDHISHT'HIR actually reigned *seven and twenty thousand years ;* a fable of the same class with that of his wonderful birth, which is the subject of a beautiful *Indian* Drama : now, if we suppose his life to have lasted no longer than that of other mortals, and admit VITAT'HA and the rest to have been his regular successors, we shall fall into another absurdity ; for then, if the generations in both lines were nearly equal, as they would naturally have been, we shall find YUDHISHT'HIR, who reigned confessedly at the close of the *brazen* age, nine generations older than RA'MA, before whose birth the *silver* age is allowed to have ended. After the name of BHARAT, therefore, I have set an asterisk to denote a considerable chasm in the *Indian* History, and have inserted between brackets, as out of their places, his *twenty-four* successors, who reigned, if at all, in the following age immediately before the war of the *Mahábhárat.* The fourth *Avatàr,* which is placed in the interval between the *first,* and *second* ages, and the *fifth* which soon followed it, appear to be moral fables grounded on historical facts : the *fourth* was the punishment of an impious monarch by the Deity himself *bursting from a marble Column* in the shape of a *lion ;* and the *fifth* was the humiliation of an arrogant Prince by so contemptible an agent as a mendicant *dwarf.* After these, and immediately before BUDDHA, come three great warriors all named RA'MA ; but it may justly be made a question, whether they are not three representations of one person, or three different ways of relating the same History : the first and second RA'MAS are said to have been contemporary ; but whether all or any of them mean RA'MA, the son of CU'SH, I leave others to determine. The mother of the Second RA'MA was named CAU'SHALYA', which is a derivative of CUSHALA, and, though his father be distinguished by the title or epithet of DA'SARAT'HA signifiying, that *his War-chariot bore him to all quarters of the world,* yet the name of CUSH, as the *Cáshmírians* pronounce it, is preserved entire in that of his son and successor, and shadowed in that of his ancestor VICUCSHI ; nor can a just objection be made to this opinion from the nasal *Ara-*

bian vowel in the word *Râmah* mentioned by MOSES, since the very word *Arab* begins with the same letter, which the *Greeks* and *Indians* could not pronounce; and they were obliged, therefore, to express it by the vowel, which most resembled it. On this question, however, I assert nothing; nor on another, which might be proposed: "whether the *fourth* and *fifth Avatàrs* be not allegorical "stories of the two presumptuous monarchs, NIMROD and BELUS." The hypothesis, that *government* was first established, *laws* enacted, and *agriculture* encouraged in *India* by RA'MA about *three thousand eight hundred* years ago, agrees with the received account of NOAH'S death, and the previous settlement of his immediate descendants.

THIRD AGE.

CHILDREN OF THE

	SUN.	MOON.	
	Cus'ha,		
	Atit'hi,		
	Nishadha,		
	Nabhas,		
5.	Pund'aríca,		
	Cshémadhanwas,	Vitat'ha,	
	Dévánìca,	Manyu,	
	Anín'agu,	Vríhatcshétra,	
	Páripátra,	Hastin,	
10.	Ranach'hala,	Ajamíd'ha,	5.
	Vajranábha,	Rícsha,	
	Arca,	Samwarana,	
	Sugana,	*Curu,*	
	Vidhríti,	*Jahnu,*	
15.	Hiranyanábha,	Surat'ha,	10.
	Pushya,	Vidúrat'ha,	
	Dhruvasańdhi,	Sárvabhauma,	
	Suders'ana,	Jayatséna,	
	Agniverna,	Rádhica,	
20.	Síghra,	Ayutáyush,	15.
	Maru, supposed to be still alive.	Acródhana,	
	Prasus'ruta,	Dévatit'hi,	
	Sańdhi,	Ricsha,	

CHILDREN OF THE

	SUN.	MOON.	
	Amers´ana,	Dilípa,	
25.	Mahaswat,	Pratípa,	20.
	Vis´wabháhu,	Sántanu,	
	Prasénajit,	Vichitravírya,	
	Tacshaca,	Pándu,	
	Vrihadbala,	*Yudhisht´hira*,	
30.	Vrihadran´a, Y. B. C. 3100.	*Parícshit*,	25.

Here we have only *nine* and *twenty* princes of the solar line between RA´MA and VRIHADRANA exclusively; and their reigns, during the whole *brazen* age, are supposed to have lasted near *eight hundred* and *sixty-four thousand* years, a supposition evidently against nature; the uniform course of which allows only a period of *eight hundred* and *seventy*, or, at the very utmost, of *a thousand*, years for *twenty-nine* generations. PARI´CSHIT, the great nephew and successor of YUDHISHT'HIR, who had recovered the throne from DURYO´DHAN, is allowed without controversy to have reigned in the interval between the *brazen* and *earthen* ages, and to have died at the setting in of the *Caliyug*; so that, if the *Pandits* of *Cashmìr* and *Varánes* have made a right calculation of BUDDHA'S appearance, the present, or *fourth*, age must have begun about *a thousand* years before the birth of CHRIST, and consequently the reign of ICSHWA´CU, could not have been earlier than *four thousand* years before that great epoch; and even that date will, perhaps, appear, when it shall be strictly examined, to be near *two thousand* years earlier than the truth. I cannot leave the third *Indian* age, in which the virtues and vices of mankind are said to have been equal, without observing, that even the close of it is manifestly fabulous and poetical, with hardly more *appearance* of historical truth, than the tale of *Troy* or of the *Argonauts*; for YUDHISHT'HIR, it seems, was the son of DHERMA, the *Genius of Justice*; BHI´MA of PAVAN, or the *God of Wind*; ARJUN of INDRA, or the *Firmament*; NACUL and SAHADE´VA, of the two CUMA´RS, the CASTOR and POLLUX of *India*; and BHI´SHMA their reputed great uncle, was the child of GANGA´, or the GANGES, by SA´NTANU, whose brother DE´VA´PI is supposed to be still alive in the city of *Calápa*; all which fictions may be charming embellishments of an heroic poem, but are just as absurd in civil

History, as the descent of two royal families from the Sun and the Moon.

FOURTH AGE.

CHILDREN OF THE

	SUN.	MOON.	
	Urucriya,	*Janaméjaya*,	
	Vatsavrĭddha,	*Satánica*,	
	Prativyóma,	Sahasránica,	
	Bhánu,	As'wamédhaja,	
5.	Déváca,	Asímacrĭshna,	5.
	Sahadéva,	Némichacra,	
	Víra,	Upta,	
	Vrĭhadas´wa,	Chitrarat'ha,	
	Bhánumat,	Suchirat'ha,	
10.	Pratícás´wa,	Dhrĭtimat,	10.
	Supratíca,	Sushéna,	
	Marudéva,	Sunít'ha,	
	Sunacshatra,	Nrĭchacshuh,	
	Pushcara,	Suc'hinala,	
15.	Antarícsha,	Pariplava,	15.
	Sutapas,	Sunaya,	
	Amitrajit,	Médhávin,	
	Vrĭhadrája,	Nrĭpanjaya,	
	Barhi,	Derva,	
20.	Crĭtanjaya,	Timi,	20.
	Ran´anjaya,	Vrĭhadrat'ha,	
	Sanjaya,	Sudása,	
	Slócya,	Satáníca,	
	Suddhóda,	Durmadana,	
25.	Lángalada,	Rahínara,	25.
	Prasénajit,	Dand´apán´i,	
	Cshudraca,	Nimi,	
	Sumitra, Y. B. C. 2100.	Cshémaca.	

In both families, we see, *thirty* generations are reckoned from YUDHISHT'HIR and from VRIHADBALA his contemporary, (who was killed, in the war of *Bhárat*, by ABHIMANYU, son of ARJUN and father of PARI´CSHIT), to the time, when the *Solar* and *Lunar* dynasties are believed to have become extinct in the present divine age; and for these generations the *Hindus* allot a period of *one thousand* years only, or a *hundred* years for *three* generations; which calculation, though probably too large, is yet moderate enough, compared with their absurd accounts of the preceding ages: but they reckon exactly the same number of years for *twenty* generations only in the family of JARÁSANDHA, whose son was contemporary with YUDHISHT'HIR, and founded a new dynasty of princes in *Magadha*, or *Bahàr;* and this exact coincidence of the time, in which the three races are supposed to have been extinct, has the appearance of an artificial chronology, formed rather from imagination than from historical evidence; especially as twenty kings, in an age comparatively modern, could not have reigned a thousand years. I, nevertheless, exhibit the list of them as a curiosity; but am far from being convinced, that all of them ever existed: that, if they did exist, they could not have reigned more than *seven hundred* years, I am fully persuaded by the course of nature and the concurrent opinion of mankind.

KINGS OF MAGADHA.

Sahadéva,
Márjári,
Srutasravas,
Ayutáyush,
5. Niramitra,
Sunacshatra,
Vrihetséna,
Carmajit,
Srutañjaya,
10. Vipra,
Suchi,
Cshéma,
Suvrata,
Dhermasutra,
Srama, 15.
Drid'haséna,
Sumati,
Subalà,
Sumíta,
Satyajit, 20.

Puranjaya, son of the twentieth king, was put to death by his minister SUNACA, who placed his own son PRADYÓTA on the throne of his master; and this revolution constitutes an epoch of the highest importance in our present inquiry; first, because it happened according to the *Bhágawatámrĭta*, two years exactly before BUDDHA'S appearance in the same kigdom; next, because it is believed by the *Hindus* to have taken place *three thousand eight hundred* and *eighty-eight* years ago, or *two thousand one hundred* years before CHRIST; and lastly, because a regular chronology, according to the number of years in each dynasty, has been established from the accession of PRADYO´TA to the subversion of the genuine *Hindu* government; and that chronology I will now lay before you, after observing only, that RA´DHA´CA´NT himself says nothing of BUDDHA in this part of his work, though he particularly mentions the two preceding *Avatára's* in their proper places.

KINGS OF MAGADHA.

		Y.B.C.
Pradyóta,		2100
Pálaca,		
Vis´ác'hayúpa,		
Rájaca,		
Nandiverdhana,	5 reigns = 138 years,	
Sis´unága,		1962
Cácaverna,		
Cshémadherman,		
Cshétrajnya,		
Vidhisára,	5.	
Ajátasatru,		
Darbhaca,		
Ajaya,		
Nandiverdhana,		
Mahánandi,	10 *r* = 360 *y*.	
NANDA,		1602

This prince, of whom frequent mention is made in the *Sanscrit* books, is said to have been murdered, after a reign of *a hundred years*, by a very learned and ingenious, but passionate and vindictive, *Bráhman*, whose name was CHA´NACYA, and who raised to the throne a man of the *Maurya* race, named CHANDRAGUPTA: by the death of NANDA, and his sons, the *Cshatriya* family of PRADYO´TA became extinct.

MAURYA KINGS.

	Y.B.C.
Chandragupta,	1502
Várisára,	

MAURYA KINGS.—*Continued.*

Y.B.C.

As'ócaverdhana,
Suyas'as,
Des'arat'ha, 5.
Sangata,
Sális'úca,
Sómas'arman,
Satadhanwas,
Vrǐhadrat'ha, 10 *r*=137 *y*.

On the death of the tenth *Maurya* king, his place was assumed by his Commander-in-Chief, **Pushpamitra**, of the *Sunga* nation or family.

SUNGA KINGS.

Y.B.C.
1365

Pushpamitra,
Agnimitra,
Sujyésht'ha,
Vasumitra,
Abhadraca, 5.
Pulinda,
Ghósha,
Vajramitra,
Bhágavata,
Dévabhúti, 10 *r*=112 *y*.

The last prince was killed by his minister **Vasude'va**, of the *Can'n'a* race, who usurped the throne of *Magadha*.

CANNA KINGS.

Y.B.C.
1253

Vasudéva,
Bhúmitra,
Náráyana,
Susarman, 4 *r*=345 *y*.

A *Súdra*, of the *Andhra* family, having murdered his master **Susarman**, and seized the government, founded a new dynasty of

ANDHRA KINGS.

		Y.B.C.
Balin,		908
Crĭshna,		
Srís´ántacarna,		
Paurnamása,		
Lambódara,	5.	
Vivilaca,		
Méghaswáta,		
Vátamána,		
Talaca,		
Sivaswáti,	10.	
Puríshabhéru,		
Sunandana,		
Chacóraca,		
Bátāca,		
Gómatin,	15.	
Purímat,		
Médas´iras,		
Sirascand'ha,		
Yajñyas´rì,		
Vijaya,	20.	
Chandrabíja,	21 *r*=456 *y*.	

After the death of CHANDRABI´JA, which happened, according to the *Hindus*, 396 years before VICRAMA´DITYA, or 452 B.C. we hear no more of *Magadha* as an independent kingdom; but RA´DHA´CA´NT has exibited the names of *seven* dynasties, in which *seventy-six* princes are said to have reigned *one thousand three hundred and ninety-nine* years in *Avabhrĭti*, a town of the *Dacshin*, or *South*, which we commonly call *Decan;* the names of the seven dynasties, or of the families who established them, are *Abhíra*, *Gardabhin*, *Canca*, *Yavana*, *Turushcara*, *Bhurunda*, *Maula;* of which the *Yavana's* are by some, not generally, supposed to have been *Ionians*, or *Greecks*, but the *Turushcars* and *Maula's* are universally believed to have been *Turcs* and *Moglus;* yet RA´DHA´CA´NT adds: "when the *Maula* race was extinct, five princes, named "*Bhúnanda*, *Bangira*, *Sis´unandi*, *Yas´ónandi*, and *Pravíraca*, reign-

"ed *an hundred and six* years (or till the year 1053) in the city of "*Cilacilà*," which, he tells me, he understands to be in the country of the *Maháráshtra's*, or *Mahráta's ;* and here ends his *Indian* Chronology; for "after PRAVI´RACA, says he, this empire was divided "among *Mléch'has*, or Infidels." This account of the *seven modern dynasties* appears very doubtful in itself, and has no relation to our present inquiry ; for their dominion seems confined to the *Decan*, without extending to *Magadha ;* nor have we any reason to believe, that a race of *Greecian* princes ever established a kingdom in either of those countries : as to the *Moguls*, their dynasty still subsists, at least nominally; unless that of *Chengiz* be meant, and his successors could not have reigned in any part of *India* for the period of *three hundred* years, which is assigned to the *Maulas ;* nor is it probable, that the word *Turc*, which an *Indian* could have easily pronounced and clearly expressed in the *Nágarì* letters, should have been corrupted into *Turushcara*. On the whole we may safely close the most authentic system of *Hindu* Chronology, that I have yet been able to procure, with the death of CHANDRABI´JA. Should any farther information be attainable, we shall, perhaps, in due time attain it either from books or inscriptions in the *Sanscrit* language ; but from the materials, with which we are at present supplied, we may establish as indubitable the two following propositions ; that the *three first* ages of the *Hindus* are chiefly *mythological*, whether their mythology was founded on the dark enigmas of their astronomers or on the heroic fictions of their poets, and, that the *fourth*, or *historical*, age cannot be carried farther back than about two thousand years before CHRIST. Even in the history of the present age, the generations of men and the reigns of kings are extended beyond the course of nature, and beyond the average resulting from the accounts of the *Bráhmans* themselves; for they assign to *an hundred and forty-two* modern reigns a period of *three thousand one hundred and fifty-three* years, or about *twenty-two* years to a reign one with another ; yet they represent only four *Canna* princes on the throne of *Magadha* for a period of *three hundred* and *forty-five* years ; now it is even more improbable, that four successive kings should have reigned *eighty-six years and three* months each, than that NANDA should have been king a *hundred* years and murdered at last. Neither account can be credited ;

but, that we may allow the highest probable antiquity to the *Hindu* government, let us grant, that *three generations* of men were equal on an average to *an hundred* years, and that *Indian* princes have reigned, one with another, *two and twenty:* then reckoning thirty generations from ARJUN, the brother of YUDHISHT'HIRA, to the extinction of his race, and taking the *Chinese* account of BUDDHA'S birth from M. DE GUIGNES, as the most authentic medium between ABU'LFAZL and the *Tibetians*, we may arrange the corrected *Hindu* Chronology according to the following table, supplying the word *about* or *nearly*, (since perfect accuracy cannot be attained and ought not to be required), before every date.

	Y.B.C.
Abhimanyu *son of* ARJUN,	2029
Pradyóta,	1029
BUDDHA,	1027
Nanda,	699
Balin,	149
VICRAMA'DITYA,	56
DE'VAPA'LA, *king of* Gaur,	23

If we take the date of BUDDHA'S appearance from ABU'LFAZL, we must place ABHIMANYU 2368 years before CHRIST, unless we calculate from the twenty kings of *Magadha*, and allow *seven hundred* years, instead of *a thousand*, between ARJUN and PRADYO'TA, which will bring us again very nearly to the date exhibited in the table; and, perhaps, we can hardly approach nearer to the truth. As to *Rájà* NANDA, if he really sat on the throne a whole century, we must bring down the *Andhra* dynasty to the age of VICRAMA'DITYA, who with his feudatories had probably obtained so much power during the reign of those princes, that they had little more than a nominal sovereignty, which ended with CHANDRABI'JA in the *third* or *fourth* century of the *Christian* era; having, no doubt, been long reduced to insignificance by the kings of *Gaur*, descended from GO'PA'LA. But, if the author of the *Dabistàn* be warranted in fixing the birth of BUDDHA *ten* years before the *Caliyug*, we must thus correct the Chronological Table:

	Y.B.C.
BUDDHA,	1027
Parícshit,	1017
Pradyóta, (reckoning 20 *or* 30 generations),	317 or 17
	Y.A.C.
Nanda,	13 or 313

This correction would oblige us to place VICRAMADITYA before NANDA, to whom, as all the *Pandits* agree, he was long posterior; and, if this be an historical fact, it seems to confirm the *Bhágawatâmrĭta*, which fixes the beginning of the *Caliyug* about *a thousand* years before BUDDHA; besides that BALIN would then be brought down at least to the sixth and CHANDRABÍJA to the tenth century after CHRIST, without leaving room for the subsequent dynasties, if they reigned successively.

Thus have we given a sketch of *Indian* History through the longest period fairly assignable to it, and have traced the foundation of the *Indian* empire above *three thousand eight hundred years* from the present time; but, on a subject in itself so obscure, and so much clouded by the fictions of the *Bráhmans*, who, to aggrandize themselves, have designedly raised their antiquity beyond the truth, we must be satisfied with probable conjecture and just reasoning from the best attainable data; nor can we hope for a system of *Indian* Chronology, to which no objection can be made, unless the Astronomical books in *Sanscrit* shall clearly ascertain the places of the colures in some precise years of the historical age, not by loose traditions, like that of a coarse observation by CHIRON, who possibly never existed, (for "he lived, says NEWTON, in the *golden* "age," which must long have preceded the *Argonautic* expedition) but by such evidence as our own astronomers and scholars shall allow to be unexceptionable.

A CHRONOLOGICAL TABLE, *according to one of the* Hypotheses *intimated in the preceding tract.*

CHRISTIAN *and* MUSELMAN.	HINDU.	*Years from* 1788 *of our era.*
ADAM,	MENU I. Age I.	5794
NOAH,	MENU II.	4737
Deluge,		4138
Nimrod,	*Hiranyacasipu*. Age II.	4006
Bel,	*Bali*,	3892
RAMA,	RAMA. Age III.	3817
Noah's death,		3787
	Pradyóta,	2817
	BUDDHA. Age IV.	2815
	Nanda,	2487
	Balin,	1937
	Vicramáditya,	1844
	Dévapála,	1811
CHRIST,		1787
	Náráyanpála,	1721
	Saca,	1709
Walìd,		1080
Mahmùd,		786
Chengiz,		548
Taimùr,		391
Babur,		276
Nádirshàh,		49

VIII.

On the CURE *of the* ELEPHANTIASIS.

By AT'HAR ALI' KHA'N *of* Delhi.

INTRODUCTORY NOTE.

AMONG the afflicting maladies, which punish the vices and try the virtues of mankind, there are few disorders, of which the consequences are more dreadful or the remedy in general more desperate than the *judhám* of the *Arabs* or *khórah* of the *Indians ;* it is also called in *Arabia dáül'ásad*, a name corresponding with the *Leontiasis* of the *Greeks*, and supposed to have been given in allusion to the grim distracted and *lionlike* countenances of the miserable persons, who are affected with it. The more common name of the distemper is *Elephantiasis*, or, as LUCRETIUS calls it, *Elephas*, because it renders the skin, like that of an *Elephant*, uneven and wrinkled, with many tubercles and furrows ; but this complaint must not be confounded with the *dáül'fíl*, or *swelled legs*, described by the *Arabian* physicians, and very common in this country. It has no fixed name in *English*, though HILLARY, in his *Observations on the Diseases of Barbados*, calls it the *Leprosy of the joints*, because it principally affects the extremities, which in the last stage of the malady are distorted and at length drop off ; but, since it is in truth a distemper corrupting the whole mass of blood, and therefore considered by PAUL of *Ægina* as an *universal ulcer*, it requires a more general appellation, and may properly be named the *Black Leprosy ;* which term is in fact adopted by M. BOISSIEU de SAUVAGES and GORRŒUS, in contradistinction to the *White* Leprosy, or the *Beres* of the *Arabs* and *Leuce* of the *Greeks*.

This disease, by whatever name we distinguish it, is peculiar to hot climates, and has rarely appeared in *Europe :* the philosophical Pōet of *Rome* supposes it confined to *the banks of the Nile ;* and it has certainly been imported from *Africa* into the *West-India* Islands by the black slaves, who carried with them their resentment and their revenge ; but it has been long known in *Hindustan*, and the writer of the following Dissertation, whose father was Physician to

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NA'DIRSHAH and accompanied him from *Persia* to *Delhi*, assures me that it rages with virulence among the native inhabitants of *Calcutta*. His observation, that it is frequently a consequence of the *veneral infection*, would lead us to believe, that it might be radically cured by *Mercury;* which has, nevertheless, been found ineffectual, and even hurtful, as HILLARY reports, in the *West-Indies*. The juice of *hemlock*, suggested by the learned MICHAELIS, and approved by his medical friend ROEDERER, might be very efficacious at the beginning of the disorder, or in the milder sorts of it; but, in the case of a malignant and inveterate *judhám*, we must either administer a remedy of the highest power, or, agreeably to the desponding opinion of CELSUS, *leave the patient to his fate, instead of teasing him with fruitless medicines*, and suffer him, in the forcible words of ARETÆUS, *to sink from inextricable slumber into death*. The life of a man is, however, so dear to him by nature, and in general so valuable to society, that we should never despond, while a spark of it remains; and, whatever apprehensions may be formed of future danger from the distant effects of *arsenic*, even though it should eradicate a present malady, yet, as no such inconvenience has arisen from the use of it in *India*, and, as Experience must ever prevail over Theory, I cannot help wishing, that this ancient *Hindu* medicine may be fully tried under the inspection of our *European* Surgeons, whose minute accuracy and steady attention must always give them a claim to superiority over the most learned natives; but many of our countrymen have assured me, that they by no means entertain a contemptuous opinion of the native medicines, especially in diseases of the skin. Should it be thought, that the mixture of sulphur must render the poison less active, it may be advisable at first to administer orpiment, instead of the *crystalline arsenic.*

On the CURE *of the* ELEPHANTIASIS, *and other* DISORDERS *of the* BLOOD.

GOD is the all-powerful Healer.

IN the year of the MESSIAH 1783, when the worthy and respectable *Maúlavi* MI'R MUHAMMED HUSAI'N, who excels in every branch of useful knowledge, accompanied Mr. RICHARD JOHNSON from *Lac'hnau* to *Calcutta*, he visited the humble writer of this tract, who had long been attached to him with sincere affection; and, in the course of their conversation, 'One of the fruits of my late excursion, said he, is a present for you, which suits your profession, 'and will be generally useful to our species: conceiving you to 'be worthy of it by reason of your assiduity in medical inquiries, I 'have brought you a prescription, the ingredients of which are easily 'found, but not easily equalled as a powerful remedy against all corruptions of the blood, the *judhám*, and the *Persian* fire, the remains 'of which are a source of infinite maladies. It is an old secret of the '*Hindu* Physicians; who applied it also to the cure of cold and 'moist distempers, as the palsy, distortions of the face, relaxation 'of the nerves, and similar diseases: its efficacy too has been proved by long experience; and this is the method of preparing it.

'Take of white *arsenic*, fine and fresh, one *tólá*; of picked 'black pepper six times as much: let both be well beaten at intervals for four days successively in an iron mortar, and then reduced 'to an impalpable powder in one of stone with a stone pestle, and 'thus completely levigated, a little water being mixed with them. 'Make pills of them as large as tares or small pulse, and keep them 'dry in a shady place*.

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* The lowest weight in general use among the *Hindus* is the *reti*, called in *Sanscrit* either *retticà* or *racticà*, indicating *redness*, and *crishnalà* from *crishna*, *black*: it is the *red* and *black* seed of the *gunjà*-plant, which is a creeper of the same class and order at least with the *glycyrrhiza*; but I take this from report, having never examined its blossoms. One *ratticà* is said to be of equal weight with three barley-corns or four grains of rice in the husk; and eight *reti*-weights, used by jewellers, are equal to seven carats. I have weighed a number of the seeds in diamond-scales, and find the average. Apothecary's weight of one seed to be a grain *and five-sixteenths*. Now in the *Hindu* medical books *ten* of the *ratticà*-seeds are one *máshaca*, and *eight máshaca's*, make a *tólaca* or *tólà*; but in the law-books of *Bengal* a *máshaca* consists of *sixteen racticà's*, and a *tólaca* of *five mashà's*; and, according to some authorities, *five reti's* only go to one *máshà*, *sixteen* of which make a *tólaca*. We may observe, that the silver *reti*-weights, used by the goldsmiths at *Banáres*, are *twice* as heavy as the *seeds*; and thence it is, that *eight reti's* are commonly said to constitute one *máshà*, that is, *eight* silver weights, or *sixteen* seeds; *eighty* of which seeds, or 105 grains, constitute the quantity of arsenic in the *Hindu* prescription.

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‘ One of those pills must be swallowed morning and evening ‘ with some *betel*-leaf, or, in countries where *betel* is not at hand, with ‘ cold water : if the body be cleansed from foulness and obstruc‘tions by gentle cathartics and bleeding, before the medicine is ‘administered, the remedy will be speedier.’

The principal ingredient of this medicine is the *arsenic*, which the *Arabs* call *Shucc*, the *Persians mergi músh*, or *mouse-bane*, and the *Indians, sanc'hyá ;* a mineral substance ponderous and *crystalline :* the *orpiment*, or *yellow* arsenic, is the weaker sort. It is a deadly poison, so subtil, that, when mice are killed by it, the very smell of the dead will destroy the living of that species: after it has been kept about seven years, it loses much of its force ; its colour becomes turbid ; and its weight is diminished. This mineral is hot and dry in the fourth degree : it causes suppuration, dissolves or unites, according to the quantity given ; and is very useful in closing the lips of wounds, when the pain is too intense to be borne. An unguent made of it with oils of any sort is an effectual remedy for some cutaneous disorders, and, mixed with rose-water, it is good for cold tumours and for the dropsy ; but it must never be administered without the greatest caution ; for such is its power, that the smallest quantity of it in powder, drawn, like *álcohol*, between the eyelashes, would in a single day entirely corròde the coats and humours of the eye ; and fourteen *retí's* of it would in the same time destroy life. The best antidote against its effects are the scrapings of leather reduced to ashes : if the quantity of arsenic taken be accurately known, four times as much of those ashes, mixed with water and drunk by the patient, will sheath and counteract the poison.

The writer, conformably to the directions of his learned friend, prepared the medicine ; and, in the same year, gave it to numbers, who were reduced by the diseases above mentioned to the point of death : GOD is his witness, that they grew better from day to day, were at last completely cured, and are now living (except one or two, who died of other disorders) to attest the truth of this assertion. One of his first patients was a *Pársì*, named MENU'CHEHR, who had come from *Surat* to this city, and had fixed his abode near the writer's house : he was so cruelly afflicted with a confirmed lues, here called *the Persian Fire*, that his hands and feet were entirely ulcerated and almost corroded, so that he became an object of disgust and abhorrence. This man consulted the writer on his case, the state of which he disclosed without reserve. Some blood was taken from him on the same day, and a cathartic administered on the next. On the third day he began to take the *arsenic-pills*, and, by the blessing of GOD, the virulence of his disorder abated by degrees, until signs or returning health appeared; in a fortnight his recovery was complete, and he was bathed, according to the practice of our Physicians: he seemed to have no virus left in his blood, and none has been since perceived by him.

But the power of this medicine has chiefly been tried in the cure of the *juzám*, as the word is pronounced in *India*; a disorder infecting the whole mass of blood, and thence called by some *fisádi-khún*. The former name is derived from an *Arabic* root signifying, in general, *amputation*, *maiming*, *excision*, and, particularly, the *truncation* or *erosion of the fingers*, which happens in the last stage of the disease. It is extremely contagious, and, for that reason, the Prophet said: *ferrú mina'lmejdhúmi camá teferrú mina'l ásad*, or, 'Flee from a person afflicted with the *judhám*, as you would 'flee from a lion.' The author of the *Bahhru'ljawáhir*, or *Sea of Pearls*, ranks it as an infectious malady with the *measles*, the *small-pox*, and the *plague*. It is also *hereditary*, and, in that respect, classed by medical writers with the *gout*, the *consumption*, and the *white leprosy*.

A common cause of this distemper is the unwholesome diet of the natives, many of whom are accustomed, after eating a quantity of *fish*, to swallow copious draughts of *milk*, which fail not to cause an accumulation of yellow and black bile, which mingles itself with the blood and corrupts it: but it has other causes; for a *Bráhmen*, who had never tasted *fish* in his life, applied lately to the composer of this essay, and appeared in the highest degree affected by corruption of blood; which he might have inherited, or acquired by other means. Those, whose religion permits them to eat *beef*, are often exposed to the danger of heating their blood intensely through the knavery of the butchers in the *Bázár*, who fatten their calves with *Baláwer*; and those, who are so ill-advised as to take *provocatives*, a folly extremely common in *India*, at first are insensible of mischief, but, as soon as the increased moisture is dispersed, find their whole mass of blood inflamed, and, as it were, adust; whence arises the disorder, of which we now are treating. The *Persian*, or venereal, Fire generally ends in this malady; as one DE'VI' PRASA'D, lately in the service of Mr. VANSITTART, and some others, have convinced me by an unreserved account of their several cases.

It may here be worth while to report a remarkable case, which was related to me by a man, who had been afflicted with the *juzám* near four years; before which time he had been disordered with the *Persian* fire, and, having closed an ulcer by the means of a strong healing plaister, was attacked by a violent pain in his joints: on this he applied to a *Cabirája*, or *Hindu* Physician, who gave him some pills, with a positive assurance, that the use of them would remove his pain in a few days; and in a few days it was, in fact, wholly removed; but, a very short time after, the symptoms of the *juzám* appeared, which continually encreased to such a degree, that his fingers and toes were on the point of dropping off. It was afterwards discovered, that the pills, which he had taken, were made of cinnabar, a common preparation of the *Hindus;* the heat of which had first stirred the humours, which, on stopping the external discharge, had fallen on the joints, and then had occasioned a quantity of adust bile to mix itself with the blood and infect the whole mass.

Of this dreadful complaint, however caused, the first symptoms are a numbness and redness of the whole body, and principally of the face, and impeded hoarse voice, thin hair and even baldness, offensive perspiration and breath, and whitlows on the the nails. The cure is best begun with copious bleeding, and cooling drink, such as a decoction of the *nílúfer*, or *Nymphea*, and of violets, with some doses of manna; after which stronger cathartics must be administered. But no remedy has proved so efficacious as the pills composed of arsenic and pepper: one instance of their effect may here be mentioned, and many more may be added, if required.

In the month of *February* in the year just mentioned, one *Shaikh* RAMAZA'NI', who then was an upper-servant to the Board of Revenue, had so corrupt a mass of blood, that a black leprosy of his joints was approaching; and most of his limbs began to be ulcerated : in this condition he applied to the writer, and requested immediate assistance. Though the disordered state of his blood was evident on inspection, and required no particular declaration of it, yet many questions were put to him, and it was clear from his answers, that he had a confirmed *juzàm :* he then lost a great deal of blood, and, after due preparation, took the arsenic-pills. After the first week his malady seemed alleviated ; in the second it was considerably diminished, and, in the third, so entirely removed, that the patient went into the bath of health, as a token that he no longer needed a physician.

IX.

On the INDIAN GAME *of* CHESS.

By the PRESIDENT.

IF evidence be required to prove that chess was invented by the *Hindus*, we may be satisfied with the testimony of the *Persians;* who, though as much inclined as other nations to appropriate the ingenious inventions of a foreign people, unanimously agree, that the game was imported from the west of *India*, together with the charming fables of VISHNUSARMAN, in the sixth century of our era: it seems to have been immemorially known in *Hindustan* by the name of *Chaturanga*, that is, the four *anga's*, or *members*, of an army, which are said in the *Amaracósha* to be *hastyas'warat'hapádátam*, or *elephants*, *horses*, *chariots*, and *foot-soldiers;* and, in this sense, the word is frequently used by Epic poets in their descriptions of real armies. By a natural corruption of the pure *Sanscrit* word, it was changed by the old *Persians* into *Chatrang*, but the *Arabs*, who soon after took possession of their country, had neither the initial nor final letter of that word in their alphabet, and consequently altered it further into *Shatranj*, which found its way presently into the modern *Persian*, and at length into the dialects of *India*, where the true derivation of the name is known only to the learned: thus has a very significant word in the sacred language of the *Bráhmans* been transformed by successive changes into *axedrez*, *scacchi*, *échecs*, *chess*, and, by a whimsical concurrence of circumstances, given birth to the *English* word *check*, and even a name to the *Exchequer* of *Great Britain*. The beautiful simplicity and extreme perfection of the game, as it is commonly played in *Europe* and *Asia*, convince me, that it was invented by one effort of some great genius; not completed by gradual improvements, but formed, to use the phrase of *Italian* critics, *by the first intention;* yet of this simple game, so exquisitely contrived, and so certainly invented in *India*, I cannot find any account in the classical writings of the *Bráhmans*. It is, indeed, confidently asserted, that *Sanscrit* books on Chess exist in this country, and, if they can be procured at

Banáres, they will assuredly be sent to us: at present I can only exhibit a description of a very ancient *Indian* game of the same kind; but more complex, and, in my opinion, more modern, than the simple Chess of the *Persians.* This game is also called *Chaturanga*, but, more frequently *Chatúrájì*, or the *four Kings*, since it is played by four persons representing as many princes, two allied armies combating on each side: the description is taken from the *Bhawishya Purán*, in which YUDHISHT'HIR is represented conversing with VYA´SA, who explains at the king's request the form of the fictitious warfare and the principal rules of it: "having marked "*eight* squares on all sides, says the Sage, place the *red* army to "the east, the *green* to the south, the *yellow* to the west, and the "*black* to the north: let the *elephant* stand on the left of the *king*; "next to him, the *horse*; then, the *boat*; and, before them all, four "*foot-soldiers*; but the *boat* must be placed in the *angle* of the board." From this passage it clearly appears, that an army, with its four *anga's*, must be placed on each side of the board, since an *elephant* could not stand, in any other position on the *left* hand of each *king*; and RA´DHA´CA´NT informed me, that the board consisted, like ours, of *sixty-four* squares, half of them occupied by the forces, and half vacant: he added, that this game is mentioned in the oldest law-books, and that it was invented by the wife of RA´VAN, king of *Lancà*, in order to amuse him with an image of war, while his metropolis was closely besieged by RAMA in the second age of the world. He had not heard the story told by FIRDAUSI near the close of the *Sháhnámah*, and it was probably carried into *Persia* from *Cányacuvja*, by BORZU, the *favourite physician*, thence called *Vaidyapriya*, of the great ANU´SHIRAVA´N; but he said, that the *Bráhmans* of *Gaur*, or *Bengal*, were once celebrated for superior skill in the game, and that his father, together with his spiritual preceptor JAGANNA´T'H, now living at *Tribéni*, had instructed two young *Bráhmans* in all the rules of it, and had sent them to *Jayanagar* at the request of the late *Rájà*, who had liberally rewarded them. A *ship*, or *boat*, is substituted, we see, in this complex game for the *rat'h*, or armed *chariot*, which the *Bengalese* pronounce *rot'h*, and which the *Persians* changed into *rokh*, whence came the *rook* of some *European* nations; as the *vierge* and *fol* of the *French* are supposed to be corruptions of *ferz*

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and *fil*, the *prime minister* and *elephant* of the *Persians* and *Arabs*: it were vain to seek an etymology of the word *rook* in the modern *Persian* language; for, in all the passages extracted from FIRDAUSI and JA'MI, where *rokh* is conceived to mean a *hero*, or a *fabulous bird*, it signifies, I believe, no more than a *cheek* or a *face*; as in the following description of a procession in *Egypt*: "when a thousand "youths, like cypresses, box-trees, and firs, with locks as fragrant, "cheeks as fair, and bosoms as delicate, as lilies of the valley, were "marching gracefully along, thou wouldst have said, that the new "spring was *turning his face* (not, as HYDE translates the words, "*carried on rokhs)* from station to station;" and, as to the battle of the *duwázdeh rokh*, which D'HERBELOT supposes to mean *douze preux chevaliers*, I am strongly inclined to think, that the phrase only signifies a combat of *twelve persons face to face*, or six on a side. I cannot agree with my friend RA'DHA'CA'NT, that a *ship* is properly introduced in this imaginary warfare instead of a *chariot*, in which the old *Indian* warriors constantly fought; for, though the *king* might be supposed to sit in a *car*, so that the four *anga's* would be complete, and though it may often be necessary in a real campaign to pass rivers or lakes, yet no river is marked on the *Indian*, as it is on the *Chinese*, chess-board, and the intermixture of ships with horses, elephants, and infantry embattled on a plain, is an absurdity not to be defended. The use of *dice* may, perhaps, be justified in a representation of war, in which *fortune* has unquestionably a great share, but it seems to exclude chess from the rank, which has been assigned to it, among the sciences, and to give the game before us the appearance of *whist*, except that pieces are used openly, instead of cards which are held concealed: nevertheless we find, that the moves in the game described by VYA'SA were to a certain degree regulated by *chance*; for he proceeds to tell his royal pupil, that, "if *cinque* be thrown, the *king* or a *pawn* must be "moved; if *quatre*, the *elephant*; if *trois*, the *horse*; and if *deux*, "the *boat*."

He then proceeds to the moves: "the *king* passes freely on all "sides but over *one* square only; and with the same limitation, the "*pawn* moves, but he advances straight forward, and kills his "enemy through an angle; the *elephant* marches in all directions, "as far as his driver pleases; the *horse* runs obliquely, traversing "three squares; and the *ship* goes over two squares diagonally." The elephant, we find, has the powers of our *queen*, as we are pleased to call the *minister*, or *general*, of the *Persians*, and the *ship* has the motion of the piece, to which we give the unaccountable appellation of *bishop*, but with a restriction, which must greatly lessen his value.

The bard next exhibits a few general rules and superficial directions for the conduct of the game: "the *pawns* and the *ship* "both kill and may be voluntarily killed; while the *king*, the *ele-* "*phant*, and the *horse* may slay the foe, but cannot expose them- "selves to be slain. Let each player preserve his own forces with "extreme care, securing his *king* above all, and not sacrificing a "superior, to keep an inferior, piece." Here the commentator on the *Purán* observes, that, the *horse*, who has the choice of *eight* moves from any central position, must be preferred to the *ship*, who has only the choice of *four;* but this argument would not have equal weight in the common game, where the *bishop* and *tower* command a whole line, and where a knight is always of less value than a tower in action, or the bishop of that side, on which the attack is begun. "It is by the overbearing power of the *elephant*, "that the king fights boldly; let the whole army, therefore, be "abandoned, in order to secure the *elephant:* the king must never "place one elephant before another, according to the rule of GÓ- "TAMA, unless he be compelled by want of room, for he would "thus commit a dangerous fault; and, if he can slay one of two "hostile elephants, he must destroy that on his left hand." The last rule is extremely obscure; but, as GÓTAMA was an illustrious lawyer and philosopher, he would not have condescended to leave directions for the game of *Chaturanga*, if it had not been held in great estimation by the ancient sages of *India*.

All that remains of the passage, which was copied for me by RÁDHÁCÁNT and explained by him, relates to the several modes, in which a partial success or complete victory may be obtained by any one of the four players; for we shall see, that, as if a dispute had arisen between two allies, one of the kings may assume the command of all the forces, and aim at separate conquest. First; "When any one king has placed himself on the square of another "king, which advantage is called *Sinhásana*, or *the throne*, he wins “a stake; which is doubled, if he kill the adverse monarch, when “he seizes his place; and, if he can seat himself on the throne of “his ally, he takes the command of the whole army.” Secondly; “If he can occupy successively the thrones of all three princes, he “obtains the victory, which is named *Chatúrájí*, and, the stake is “doubled, if he kill the last of the three, just before he takes pos-“session of his throne; but, if he kill him on his throne, the stake “is quadrupled.” Thus, as the commentator remarks, in a real warfare, a king may be considered as victorious, when he seizes the metropolis of his adversary; but, if he can destroy his foe, he displays greater heroism, and relieves his people from any further solicitude. “Both in gaining the *Sinhásana* and the “*Chatúrájí*, says VYA'SA, the king must be supported by the “*elep'hants* or by all the forces united.” Thirdly; “When one “player has his own king on the board, but the king of his partner “has been taken, he may replace his captive ally, if he can seize “both the adverse kings; or, if he cannot effect their capture, he “may exchange his king for one of them, against the general rule, “and thus redeem the allied prince, who will supply his place.” “This advantage has the name of *Nrípácrisht́a*, or *recovered by the* “*king;* and the *Naucácrisht́a* seems to be analogous to it, but con-“fined to the case of *s'hips*. Fourthly; “If a pawn can march to any “square on the opposite extremity of the board, except that of the “king, or that of the ship, he assumes whatever power belonged to “that square; and this promotion is called *Shat́pada*, or the “*six strides*.” Here we find the rule, with a singular exception, concerning the advancement of *pawns*, which often occasions a most interesting struggle at our common chess, and which has furnished the poets and moralists of *Arabia* and *Persia* with many lively reflections on human life. It appears, that “this privilege of *Shat́*-“*pada* was not avowable, in the opinion of GOTAMA, when a player “had three pawns on the board; but, when only one pawn and “one ship remained, the pawn might advance even to the square of “a king or a ship, and assume the power of either” Fifthly; “Ac-“cording to the *Rácshasa's*, or *giants*, (that is, the people of *Lancá* “where the game was invented), there could be neither victory nor “defeat, if a king were left on the plain without force; a situation “which they named *Cácacásht'ha*.” Sixthly, “If three ships happen

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"to meet, and the fourth ship can be brought up to them in the re-"maining angle, this has the name of *Vrĭhannaucà;* and the player of "the fourth seizes all the others." Two or three of the remaining couplets are so dark, either from an error in the manuscript or from the antiquity of the language, that I could not understand the *Pandit's* explanation of them, and suspect that they gave even him very indistinct ideas; but it would be easy, if it were worth while, to play at the game by the preceding rules; and a little practice would, perhaps, make the whole intelligible. One circumstance, in this extract from the *Puràn*, seems very surprising: all games of hazard are positively forbidden by MENU, yet the game of *Chaturanga*, in which dice are used, is taught by the great VYA'SA himself, whose lawtract appears with that of GO'TAMA among the eighteen books, which form the *Dhermasástra;* but, as RA'DHA-CA'NT and his preceptor JAGANNA'T'H are both employed by government in compiling a Digest of *Indian* laws, and as both of them, especially the venerable Sage of *Tribéni*, understand the game, they are able, I presume, to assign reasons, why it should have been excepted from the general prohibition, and even openly taught by ancient and modern *Bráhmans.*

X.

TWO INSCRIPTIONS *from the* VINDHYA MOUNTAINS, *translated from the* Sanscrit *by* CHARLES WILKINS, *Esq.*

FIRST INSCRIPTION, *in a Cavern, called the Grot of the Seven* Rishi's, *near* Gaya.

1. ANANTA VARMA, master of the hearts of the people, who was the good son of *Srēē* SARDOOLA, by his own birth and great virtues classed amongst the principal rulers of the earth, gladly caused this statue of KREESHNA of unsullied renown, confirmed in the word like his own reputation, and the image of KANTEEMATEE* to be deposited in this great mountain-cave.

2. *Srēē* SARDOOLA, of established fame, jewel of the diadems of kings, emblem of time to the martial possessors of the earth, to the submissive the tree of the fruit of desire, a light to the Military Order, whose glory was not founded upon the feats of a single battle, the ravisher of female hearts, and the image of SMARA†, became the ruler of the land.

3. Wherever *Srēē* SARDOOLA is wont to cast his own discordant sight towards a foe, and the fortunate star, his broad eye, is enflamed with anger between its expanded lids, *there* falleth a shower of arrows from the ear-drawn string of the bow of his son, the renowned ANANTA VARMA the bestower of infinite happiness.

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* RADHA, the favourite Mistress of KREESHNA.

† KAMA DEVA the *Cupid* of the *Hindoos.*

SECOND INSCRIPTION, *in a Cave behind* Nagarjeni.

1. THE auspicious *Srēē* YAJNA VARMA, whose movement was as the sportive elephant's in the season of lust, was, like MANOO[*], the appointer of the military station of all the chiefs of the earth.—By whose divine offerings, the God with a thousand eyes[†] being constantly invited, the emaciated *Powlōmēē*[‡], for a long time, sullied the beauty of her cheeks with falling tears.

2. ANANTA VARMA by name, the friend of strangers ; renowned in the world in the character of valour ; by nature immaculate as the lunar beams, and who is the offspring of *Srēē* SARDOOLA :—By him this wonderful statue of BHOOTAPATEE and of DEVEE[§], the maker of all things visible and invisible and the granter of boons, which hath taken sanctuary in this cave, was caused to be made. May it protect the universe !

3. The string of his expanded bow, charged with arrows and drawn to the extremity of the shoulder, bursteth the circle's centre. Of spacious brow, propitious distinction, and surpassing beauty, he is the image of the moon with an undiminished countenance. ANANTA VARMA to the end ! Of form like SMARA[‖] in existence, he is seen with the constant and affectionate standing with their tender and fascinated eyes constantly fixed upon him.

4. From the machine his bow, reproacher of the crying *Kŏŏrărā*[¶], bent to the extreme, he is endued with force ; from his expanded virtue he is a provoker ; by his good conduct his renown reacheth to afar ; he is a hero by whose coursing steeds the elephant is disturbed, and a youth who is the seat of sorrow to the women of his foes. He is the director, and his name is ANANTA[**].

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[*] The first legislator of the *Hindus.*

[†] *Eēndră* a deification of the Heavens.

[‡] The wife of *Eēndră*

[§] *Sēēvă*, or *Măhādēvă* and his consort in one image, as a type of the deities, *Genitor* and *Genitrix.*

[‖] The Hindoo *Cupid.*

[¶] A bird that is constantly making a noise before rain.

[**] This word signifies eternal or infinite.

XI.

A DESCRIPTION *of* Asa'm *by* MOHAMMED CAZIM, *translated from the* Persian *by* HENRY VANSITTART, *Esq.*[*]

ASA'M, which lies to the north-east of *Bengal*, is divided into two parts by the river *Brahmaputra*, that flows from *Khatà*. The northern portion is called *Uttarcul*, and the southern *Dacshincul*. *Uttarcul* begins at *Gowahutty*, which is the boundary of his Majesty's territorial possessions, and terminates in mountains inhabited by a tribe called *Meeri Mechmi*. *Dacshincul* extends from the village *Sidea* to the hills of *Srinagar*. The most famous mountains to the northward of *Uttarcul*, are those of *Duleh* and *Landah*; and to the southward of *Dacshincul* are those of *Namrup*, (*Cámrùp?*) situated four days journey above *Ghergong*, to which the *Rájà* retreated. There is another chain of hills, which is inhabited by a tribe called *Nanac*, who pay no revenue to the *Rájà*, but profess allegiance to him, and obey a few of his orders. But the *Zemleh*[†] tribe are entirely independent of him, and, whenever they find an opportunity, plunder the country contiguous to their mountains. *Asàm* is of an oblong figure: its length is about 200 standard coss, and its breadth, from the northern to the southern mountains, about eight days journey. From *Gowahutty* to *Ghergong* are seventy-five standard coss; and from thence it is fifteen days journey to *Khoten*, which was the residence of *Peeran Wiseh*[‡], but is now called *Ava*[§], and is the capital of the *Rájà* of *Pegu*, who considers himself of the posterity of that famous General. The first five days journey from the mountains of *Cámrùp*, is performed through forests, and over hills, which are arduous and difficult to pass. You then travel eastward to *Ava* through a level and smooth country. To the northward is the plain of *Khatà*, that has been before mentioned as the place from whence the *Brahmaputra* issues, which is afterwards fed by several rivers that flow from the southern mountains of *Asàm*. The principal of these is the *Dhonec*, which has before occured in this history. It joins that broad river at the village *Luckeigereh*.

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[*] This account of *Asàm* was translated for the Society, but afterwards printed by the learned translator as an appendix to his *Ádlemgirnámah.* It is reprinted here, because our government has an interest in being as well acquainted as possible with all the nations *bordering* on the *British* territories.

In another copy this tribe are called *Dufleh*.

[‡] According to *Khondemir*, *Peeran Wiseh* was one of the nobles of *Afrasiah*, King of *Turan*, contemporary with *Kaicaus*, second Prince of the *Kianian* Dynasty. In the *Ferhung Jehangeery* and *Borhaun Kateâ* (two Persian Dictionaries), *Peeran* is described as one of the *Pehlovan* or heroes of *Turàn*, and General under *Afrasiah*, the name of whose father was *Wiseh*.

[§] This is a palpable mistake. *Khoten* lies to the north of *Himálaya*; and *Piràn Vísah* could never have seen *Ava*.

Between these rivers is an island well inhabited, and in an excellent state of tillage. It contains a spacious, clear, and pleasant country, extending to the distance of about fifty coss. The cultivated tract is bounded by a thick forest, which harbours elephants, and where those animals may be caught, as well as in four or five other forests of *Asàm*. If there be occasion for them, five or six hundred elephants may be procured in a year. Across the *Dhonec*, which is the side of *Ghergong*, is a wide, agreeable, and level country, which delights the heart of the beholder. The whole face of it is marked with population and tillage; and it presents on every side charming prospects of ploughed fields, harvests, gardens, and groves. All the island before described lies in *Dacshincul*. From the village *Selagereh* to the city of *Ghergong* is a space of about fifty coss, filled with such an uninterrupted range of gardens, plentifully stocked with fruit-trees, that it appears as one garden. Within them are the houses of the peasants, and a beautiful assemblage of coloured and fragrant herbs, and of garden and wild flowers blowing together. As the country is overflowed in the rainy season, a high and broad caussey has been raised for the convenience of travellers from *Selagereh* to *Ghergong*, which is the only uncultivated ground that is to be seen. Each side of this road is planted with shady bamboos, the tops of which meet, and are intertwined. Amongst the fruits which this country produces, are mangoes, plantains, jacks, oranges, citrons, limes, pine-apples, and *punialeh*, a species of *amleh*, which has such an excellent flavour, that every person who tastes it prefers it to the plum. There are also cocoa-nut trees, pepper vines, *Areca* trees, and the *Sádij**, in great plenty. The sugar-cane excels in softness and sweetness, and is of three colours, red, black, and white. There is ginger free from fibres, and betel vines. The strength of vegetation and fertility of the soil are such, that whatever seed is sown, or slips planted, they always thrive. The environs of *Ghergong* furnish small apricots, yams, and pomegranates; but as these articles are wild, and not assisted by cultivation and engraftment, they are very indifferent. The principal crop of this country consists in rice and *mash**. *Ades* is very scarce, and wheat and barley are never sown. The silks are excellent, and resemble those of *China;* but they manufacture very few more than are required for use. They are successful in embroidering with flowers, and in weaving velvet, and *tautbund*, which is a species of silk of which they make tents and *kenauts*†. Salt is a very precious and scarce commodity. It is found at the bottom of some of the hills, but of a bitter and pungent quality. A better sort is in common use, which is extracted from the plantain tree. The mountains, inhabited by the tribe called *Nanac*, produce plenty of excellent *Lignum Aloes*, which a society of the natives imports every year into *Asàm*, and barters for salt and grain. This evil-disposed race of mountaineers are many degrees removed from the line of humanity, and are destitute of the characteristical properties of a man. They go naked from head to foot, and eat dogs, cats, snakes, mice, rats, ants, locusts, and every thing of this sort which they can find. The hills of *Cámrùp Sidea*, and *Luckigerek*, supply a fine species of *Lignum Aloes*, which sinks in water. Several of the mountains contain musk-deer.

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* The *Sádij* is a long aromatic leaf, which has a pungent taste, and is called in *Sanscrit Téjapatra*. In our botanical books it bears the name of *Malabathrum*, or the *Indian* Leaf.

The country of *Uttarcul* which is on the northern side of the *Brahmaputra*, is in the highest state of cultivation, and produces plenty of pepper and *Areca*-nuts. It even surpasses *Dacshincul* in population and tillage; but, as the latter contains a greater tract of wild forests, and places difficult of access, the rulers of *Asàm* have chosen to reside in it for the convenience of control, and have erected in it the capital of the kingdom. The breadth of *Uttarcul*, from the bank of the river to the foot of the mountains, which is a cold climate, and contains snow, is various, but is no where less than fifteen coss, nor more than forty-five coss. The inhabitants of those mountains are strong, have a robust and respectable appear-

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* *Mash* is a species of grain, and *Ades* a kind of pea.

† *Kenauts* are walls made to surround tents.

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ance, and are of a middling size. Their complexions, like those of the natives of all cold climates, are red and white; and they have also trees and fruits peculiar to frigid regions. Near the fort of *Jum Dereh*, which is on the side of *Gowahutty*, is a chain of mountains, called the country of *Dereng*, all the inhabitants of which resemble each other in appearance, manners, and speech, but are distinguished by the names of their tribes, and places of residence. Several of these hills produce musk, *kataus*[*], *bhoat*[†], *peree*, and two species of horses, called *goont* and *tanyans*. Gold and silver are procured here, as in the whole country of *Asàm*, by washing the sand of the rivers. This, indeed, is one of the sources of revenue. It is supposed that 12,000 inhabitants, and some say 20,000, are employed in this occupation; and it is a regulation, that each of these persons shall pay a fixed revenue of a *tólà*[‡] of gold to the *Rája*. The people of *Asàm* are a base and unprincipled nation, and have no fixed religion. They follow no rule but that of their own inclinations, and make the approbation of their own vicious minds the test of the propriety of their actions. They do not adopt any mode of worship practised either by *Heathens* or *Mohammedans*; nor do they concur with any of the known sects which prevail amongst mankind. Unlike the Pagans of *Hindustàn*, they do not reject victuals which have been dressed by *Muselmans*; and they abstain from no flesh except human. They even eat animals that have died a natural death; but, in consequence of not being used to the taste of ghee, they have such an antipathy to this article, that if they discover the least smell of it in their victuals, they have no relish for them. It is not their custom to veil their women; for even the wives of the *Rája* do not conceal their faces from any person. The females perform work in the open air, with their countenances exposed and heads uncovered. The men have often four or five wives each, and publicly buy, fell, and change them. They shave their heads, beards, and whiskers, and reproach and admonish every person who neglects this ceremony. Their language has not the least affinity with that of *Bengal*[*] Their strength and courage are apparent in their looks; but their ferocious manners, and brutal tempers, are also betrayed by their physiognomy. They are superior to most nations in corporal force and hardy exertions. They are enterprising, savage, fond of war, vindictive, treacherous, and deceitful. The virtues of compassion, kindness, friendship, sincerity, truth, honour, good faith, shame, and purity of morals, have been left out of their composition. The seeds of tenderness and humanity have not been sown in the field of their frames. As they are destitute of the mental garb of manly qualities, they are also deficient in the dress of their bodies. They tie a cloth round their heads, and another round their loins, and throw a sheet upon their shoulder; but it is not customary in that country to wear turbans, robes, drawers, or shoes. There are no buildings of brick or stone, or with walls of earth, except the gates of the city of *Ghergong*, and some of their idolatrous temples. The rich and poor construct their habitations of wood, bamboos, and straw. The *Rájà* and his courtiers travel in stately litters; but the opulent and respectable persons amongst his subjects are carried in lower vehicles, called doolies. *Asàm* produces neither horses[†], camels, nor asses; but those cattle are sometimes brought thither from other countries. The brutal inhabitants, from a congenial impulse, are fond of seeing and keeping asses; and buy and sell them at a high price; but they discover the greatest surprise at seeing a camel; and are so afraid of a horse, that if one trooper should attack a hundred armed *Asamians*, they would all throw down their arms and flee; or should they not be able to escape, they would surrender themselves prisoners. Yet, should one of that detestable race encounter two men of another nation on foot, he would defeat them.

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[*] Kataus is thus described in the *Borhaun Katea*: "This word, in the language of *Rùm* "is a seacow; the tail of which is hung upon the necks of horses, and on the summit of standards. Some say that it is a cow which lives in the mountains of *Khatà*." It here means the mountain-cow, which supplies the tail that is made into *chowries*, and in *Sanscrit* is called *chámara*.

[†] *Bhoat* and *peree* are two kinds of blanket.

[‡] Eighty *reti*-weights, see page 117, *note*.

The ancient innabitants of this country are divided into two tribes, the *Asamians* and the *Cultanians*. The latter excel the former in all occupations except war, and the conduct of hardy enterprises, in which the former are superior. A body-guard of six or seven thousand *Asamians*, fierce as demons, of unshaken

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[*] This is an error: young *Bráhmens* often come from *Asàm* to *Nadiyà* for instruction, and their vulgar dialect is understood by the *Bengal* teachers.

[†] As the Author has asserted that two species of horses, called *goont* and *tanyans*, are produced in *Dereng*, we must suppose that this is a different country from *Asàm*.

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courage, and well provided with warlike arms and accoutrements, always keep watch near the *Rájà's* sitting and sleeping apartments; these are his loyal and confidential troops and patrol. The martial weapons of this country are the musquet, sword, spear, and arrow and bow of bamboo. In their forts and boats they have also plenty of cannon, *zerbzen**, and *ramchangee*, in the management of which they are very expert.

Whenever any of the *Rájàs*, magistrates, or principal men die, they dig a large cave for the deceased, in which they inter his women, attendants, and servants, and some of the magnificent equipage and useful furniture, which he possessed in his lifetime such as elephants, gold and silver, *bádcash* (large fans), carpets, clothes, victuals, lamps, with a great deal of oil, and a torch-bearer; for they consider those articles as stores for a future state. They afterwards construct a strong roof over the cave upon thick timbers. The people of the army entered some of the old caves, and took out of them the value of 90,000 rupees, in gold and silver. But an extraordinary circumstance is said to have happened, to which the mind of man can scarcely give credit, and the probability of which is contradicted by daily experience. It is this: All the Nobles came to the Imperial General, and declared, with universal agreement, that a golden betel-stand was found in one of the caves, that was dug eighty years before, which contained betel-leaf quite green and fresh; but the authenticity of this story rests upon report.

Ghergong has four gates, constructed of stone and earth; from each of which the *Rájà's* palace is distant three coss. The city is encompassed with a fence of bamboos, and within it high and broad causseys have been raised for the convenience of passengers during the rainy season. In the front of every man's house is a garden, or some cultivated ground. This is a fortified city, which encloses villages and tilled fields. The *Rájà's* palace stands upon the bank of the *Degoo*, which flows through the city. This river is lined on each side with houses, and there is a small market, which contains no shopkeepers except sellers of betel. The reason is, that it is not customary for the inhabitants to buy provisions for daily use, because they lay up a stock for themselves, which lasts them a year.

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* Swivels.

The *Rájà's* palace is surrounded by a caussey, planted on each side with a close hedge of bamboos, which serves instead of a wall. On the outside there is a ditch, which is always full of water. The circumference of the enclosure is one coss and fourteen jereebs. Within it have been built lofty halls, and spacious apartments for the *Rájà*, most of them of wood, and a few of straw, which are called *chuppers.* Amongst these is a *dìwàn khánah*, or public saloon, one hundred and fifty cubits long, and forty broad, which is supported by sixty-six wooden pillars, placed at an interval of about four cubits from each other, The *Rájà's* seat is adorned with lattice-work and carving. Within and without have been placed plates of brass, so well polished, that when the rays of the sun strike upon them, they shine like mirrors. It is an ascertained fact, that 3000 carpenters and 12,000 labourers were constantly employed in this work, during two years, before it was finished. When the *Rájà* sits in this chamber, or travels, instead of drums and trumpets they beat the *dhól** and *dand.* The latter is a round and thick instrument made of copper, and is certainly the same as the drum†, which it was customary, in the time of the ancient kings, to beat in battles and marches.

The *Rájàs* of this country have always raised the crest of pride and vain-glory, and displayed an ostentatious appearance of grandeur, and a numerous train of attendants and servants. They have not bowed the head of submission and obedience, nor have they paid tribute or revenne to the most powerful monarch ; but they have curbed the ambition, and checked the conquests, of the most victorious Princes of *Hindustàn.* The solution of the difficulties attending a war against them, has baffled the penetration of heroes, who have been stiled Conquerors of the World. Whenever an invading army has entered their territories, the *Asamians* have covered themselves in strong posts, and have distressed the enemy by stratagems, surprises, and alarms, and by cutting off their provisions. If these means have failed, they have declined a battle in the field, but have carried the peasants into the mountains, burnt the grain, and left the country empty. But when the rainy season has set in upon the advancing enemy, they have watched their

* The *dhól* is a kind of drum, which is beaten at each end.
† This is a kind of kettle-drum, and is made of a composition of several metals.

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opportunity to make excursions, and vent their rage ; the famished invaders have either become their prisoners, or been put to death. In this manner powerful and numerous armies have been sunk in that whirlpool of destruction, and not a soul has escaped.

Formerly HUSAIN SHA'H a King of *Bengal*, undertook an expedition against *Asàm*, and carried with him a formidable force in cavalry, infantry, and boats. The beginning of this invasion was crowned with victory. He entered the country, and erected the standard of superiority and conquest. The *Rájà* being unable to encounter him in the field, evacuated the plains, and retreated to the mountains. HUSAIN left his son, with a large army, to keep possession of the country, and returned to *Bengal*. The rainy season commenced, and the roads were shut up by the inundation. The *Rájà* descended from the mountains, surrounded the *Bengal* army, skirmished with them, and cut off their provisions, till they were reduced to such straights, that they were all, in a short time, either killed or made prisoners.

In the same manner MOHAMMED *Shàh*, the son of TOGLUC *Shàh*, who was king of several of the provinces of *Hindustàn*, sent a well-appointed army of a hundred thousand cavalry to conquer *Asàm ;* but they were all devoted to oblivion in that country of enchantment ; and no intelligence or vestige of them remained. Another army was dispatched to revenge this disaster ; but when they arrived in *Bengal*, they were panic-struck, and shrunk from the enterprise ; because if any person passes the frontier into that district, he has not leave to return. In the same manner, none of the inhabitants of that country are able to come out of it, which is the reason that no accurate information has hitherto been obtained relative to that nation. The natives of *Hindustàn* consider them as wizzards and magicians, and pronounce the name of that country in all their incantations and counter-charms. They say, that every person who sets his foot there, is under the influence of witchcraft, and cannot find the road to return.

Jeidej Sing*, the *Rájà* of *Asàm*, bears the title of *Swergì*, or *Celestial*. *Swerg*, in the *Hindustànì* language, means heaven. That frantic and vain-glorious prince is so excessively foolish and mistaken, as to believe that his vicious ancestors were sovereigns of the

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* Properly *Jayadhwaja Sinha*, or *the Lion with Banners of Conquest.*

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heavenly host; and that one of them, being inclined to visit the earth, decended by a golden ladder. After he had been employed some time in regulating and governing his new kingdom, he became so attached to it, that he fixed his abode in it, and never returned.

In short, when we consider the peculiar circumstances of *Asàm;* that the country is spacious, populous, and hard to be penetrated; that it abounds in perils and dangers; that the paths and roads are beset with difficulties; that the obstacles to the conquest of it are more than can be described; that the inhabitants are a savage race, ferocious in their manners, and brutal in their behaviour; that they are of a gigantic appearance, enterprising, intrepid, treacherous, well armed, and more numerous than can be conceived; that they resist and attack the enemy from secure posts, and are always prepared for battle; that they possess forts as high as heaven, garrisoned by brave soldiers, and plentifully supplied with warlike stores, the reduction of each of which would require a long space of time; that the way was obstructed by thick and dangerous bushes, and broad and boisterous rivers: when we consider these circumstances, we shall wonder that this country, by the aid of GOD, and the auspices of his Majesty, was conquered by the imperial army, and became a place for erecting the standard of the faith. The haughty and insolent heads of several of the detestable *Asàmians,* who stretch the neck of pride, and who are devoid of religion, and remote from GOD, were bruised by the hoofs of the horses of the victorious warriors. The *Muselman* heroes experienced the comfort of fighting for their religion; and the blessings of it reverted to the sovereignty of his just and pious Majesty.

The *Rájà,* whose soul had been enslaved by pride, and who had been bred up in the habit of presuming on the stability of his own government, never dreamt of this reverse of fortune; but being now overtaken by the punishment due to his crimes, fled, as has been before mentioned, with some of his nobles, attendants, and family, and a few of his effects, to the mountains of *Cámrùp.* That spot, by its bad air and water, and confined space, is rendered the worst place in the world, or rather it is one of the pits of hell. The *Rájà's* officers and soldiers, by his orders, crossed the *Dhonec,* and settled in the spacious island between that and the *Brahmaputra,* which contiains numerous forests and thickets. A few took refuge in other mountains; and watched an opportunity of committing hostilities.

Cámrùp is a country on the side of *Dacshincul*, situated between three high mountains, at the distance of four days journey from *Ghergong*. It is remarkable for bad water, noxious air, and confined prospects. Whenever the *Rájà* used to be angry with any of his subjects, he sent them thither. The roads are difficult to pass, insomuch that a foot-traveller proceeds with the greatest inconvenience. There is one road wide enough for a horse; but the beginning of it contains thick forests for about half a coss. Afterwards there is a defile, which is stony and full of water. On each side is a mountain towering to the sky.

The Imperial General remained some days in *Ghergong*, where he was employed in regulating the affairs of the country, encouraging the peasants, and collecting the effects of the *Rájà*. He repeatedly read the *Khotbeh*, or prayer, containing the name and titles of the Prince of the age, King of Kings, ALEMGEER, Conqueror of the World, and adorned the faces of the coins with the Imperial impression. At this time there were heavy showers, accompanied with violent wind, for two or three days; and all the signs appeared of the rainy season, which in that country sets in before it does in *Hindustàn*. The General exerted himself in establishing posts, and fixing guards, for keeping open the roads and supplying the army with provisions. He thought now of securing himself during the rains, and determined, after the sky should be cleared from the clouds, the lightning cease to illuminate the air, and the swelling of the water should subside, that the army should again be set in motion against the *Rája* and his attendants, and be employed in delivering the country from the evils of their existence.

The Author then mentions several skirmishes, which happened betveen the *Rájà's* forces and the Imperial troops, in which the latter were always victorious. He concludes thus:

At length all the villages of *Dacshincul* fell into the possession of the Imperial army. Several of the inhabitants and peasants, from the diffusion of the fame of his Majesty's kindness, tenderness, and justice, submitted to his government, and were protected in their habitations and property. The inhabitants of *Uttarcul* also

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became obedient to his commands. His Majesty rejoiced, when he heard the news of this conquest, and rewarded the General with a costly dress, and other distinguishing marks of his favour.

The Narrative, to which this is a supplement, gives a concise history of the military expedition into *Asàm*. In this description the Author has stopped at a period, when the Imperial troops had possessed themselves of the capital, and were masters of any part of the plain country, which they chose to occupy or over-run. The sequel diminishes the credit of the conquest, by showing that it was temporary, and that the *Rájà* did not forget his usual policy of harassing the invading army during the rainy season : but this conduct produced only the effect of distressing and disgusting it with the service, instead of absolutely destroying it, as his predecessors had destroyed former adventurers. Yet the conclusion of this war is far from weakening the panegyric which the Author has passed upon the Imperial General, to whom a difference of situation afforded an opportunity of displaying additional virtues, and of closing that life with heroic fortitude, which he had always hazarded in the field with martial spirit. His name and titles were, *Mír* JUMLEH, MOAZZIM *Khán*, *Khání Khánán*, *Sipáhì* SÁLÁR.

REMARK.

The preceding account of the *Asàmians*, who are probably superior in all respects to the *Moguls*, exhibits a specimen of the black malignity and frantic intolerance, with which it was usual, in the reign of AURANGZÌB, to treat all those, whom the crafty, cruel, and avaritious Emperor was pleased to condemn as infidels and barbarians.

XII.

On the Manners, Religion, *and* Laws *of the* Cu´ci´s, *or* Mountaineers *of* Tipra.—*Communicated in* Persian *by* JOHN RAWLINS, *Esq.*

THE inhabitants of the mountainous districts to the east of *Bengal* give the name of PA'TIYA'N to the Being, who created the Universe; but they believe, that a Deity exists in every Tree, that the Sun and Moon are Gods, and that, whenever they worship those subordinate divinities, PA'TIYA'N is pleased.

If any one among them put another to death, the Chief of the Tribe, or other persons, who bear no relation to the deceased, have no concern in punishing the murderer; but, if the murdered person have a brother, or other heir, he may take blood for blood; nor has any man whatever a right to prevent or oppose such retaliation.

When a man is detected in the commission of theft or other atrocious offence, the chieftain causes a recompense to be given to the complainant, and reconciles both parties; but the Chief himself receives a customary fine; and each party gives a feast of pork, or other meat, to the people of his respective tribe.

In ancient times it was not a custom among them to cut off the heads of the women, whom they found in the habitations of their enemies; but it happened once, that a woman asked another why she came so late to her business of sowing grain: she answered that her husband was gone to battle, and that the necessity of preparing food and other things for him had occasioned her delay. This answer was overheard by a man at enmity with her husband; and he was filled with resentment against her, considering, that, as she had prepared food for her husband for the purpose of sending him to battle against his tribe, so in general, if women were not to remain at home, their husbands could not be supplied with provision, and consequently could not make war with advantage. From that time it became a constant practice, to cut off the heads of the enemy's women; especially, if they happen to be pregnant, and therefore confined to their houses; and this barbarity is carried so far, that, if a *Cúci* assail the house of an enemy, and kill a woman with child, so that he may bring two heads, he acquires honour and celebrity in his tribe, as the destroyer of two foes at once.

As to the marriages of this wild nation; when a rich man has made a contract of marriage, he gives four or five head of *gayáls* (the cattle of the mountains) to the father and mother of the bride, whom he carries to his own house: her parents then kill the *gayáls*, and, having prepared fermented liquors and boiled rice with other eatables, invite the father, mother, brethren, and kindred of the bridegroom to a nuptial entertainment. When a man of small property is inclined to marry, and a mutual agreement is made, a similar method is followed in a lower degree; and a man may marry any woman, except his own mother. If a married couple live cordially together, and have a son, the wife is fixed and irremovable; but, if they have no son, and especially if they live together on bad terms, the husband may divorce his wife, and marry another woman.

They have no idea of heaven or hell, the reward of good, or the punishment of bad, actions; but they profess a belief, that, when a person dies, a certain spirit comes and seizes his soul, which he carries away; and that, whatever the spirit promises to give at the instant, when the body dies, will be found and enjoyed by the dead; but that, if any one should take up the corse and carry it off, he would not find the treasure.

The food of this people consists of elephants, hogs, deer, and other animals; of which if they find the carcasses or limbs in the forests, they dry them and eat them occasionally.

When they have resolved on war, they send spies, before hostilities are begun, to learn the stations and strength of the enemy, and the condition of the roads; after which they march in the night; and two or three hours before daylight, make a sudden assault with swords, lances, and arrows: if their enemies are compelled to abondon their station, the assailants instantly put to death all the males and females, who are left behind, and strip the houses of all their furniture; but, should their adversaries, having gained intelligence of the intended assault, be resolute enough to meet them in battle, and should they find themselves over-matched, they speedily retreat and quietly return to their own habitations.

If at any time they see a star very near the moon, they say, 'to-'night we shall undoubtedly be attacked by some enemy;' and they pass that night under arms with extreme vigilance. They often lie in ambush in a forest near the path, where their foes are used to pass and repass, waiting for the enemy with different sorts of weapons, and killing every man or woman, who happens to pass by: in this situation, if a leech, or a worm, or a snake should bite one of them, he bears the pain in perfect silence; and whoever can bring home the head of an enemy, which he has cut off, is sure to be distinguished and exalted in his nation. When two hostile tribes appear to have equal force in battle, and neither has hopes of putting the other to flight, they make a signal of pacific intentions, and, sending agents reciprocally, soon conclude a treaty; after which they kill several head of *gayáls*, and feast on their flesh, calling on the Sun and Moon to bear witness of the pacification: but, if one side, unable to resist the enemy, be thrown into disorder, the vanquished tribe is considered as tributary to the victors; who every year receive from them a certain number of *gayáls*, wooden dishes, weapons and other acknowledgements of vassalage. Before they go to battle they put a quantity of roasted *álu's* (esculent roots like *potatoes)* and paste of rice-flour into the hollow of bambu's and add to them a provision of dry rice with some leathern bags full of liquor: then they assemble, and march with such celerity, that in one day they perform a journey ordinarily made by letter-carries in three or four days, since they have not the trouble and delay of dressing victuals. When they reach the place to be attacked, they surround it in the night, and, at early dawn, enter it putting to death both young and old, women and children; except such as they choose to bring away captive: they put the heads, which they cut off, into leathern bags; and, if the blood of their enemies be on their hands, they take care not to wash it off When, after this slaughter, they take their own food, they thrust a part of what they eat into the mouths of the heads, which they have brought away, saying to each of them: 'Eat; quench thy 'thirst; and satisfy thy appetite: as thou hast been slain by my hand, 'so may thy kinsmen be slain by my kinsmen!' During their journey, they have usually two such meals; and every watch, or two watches, they send intelligence of their proceedings to their families: when any one of them sends word, that he has cut off the head of an enemy, the people of his family, whatever be their age or sok, express great delight, making caps and ornaments of red and black ropes; then filling some large vessels with fermented liquors, and decking themselves with all the trinkets they posses, they go forth to meet the conqueror blowing large shells, and striking plates of metal, with other rude instruments of music. When both parties are met, they show extravagant joy, men and women dancing and singing together; and, if a married man has brought an enemy's head, his wife wears a head-dress with gay ornaments, the husband and wife alternately pour fermented liquor into each other's mouths, and she washes his bloody hands with the same liquor, which they are drinking: thus they go revelling, with excessive merriment, to their place of abode; and, having piled up the heads of their enemies in the court-yard of their chieftain's house, they sing and dance round the pile; after which they kill some *gayáls* and hogs with their spears, and, having boiled the flesh, make a feast on it, and drink the fermented liquor. The richer men of this race fasten the heads of their foes on a bambu, and fix it on the graves of their parents; by which act they acquire great reputation. He, who brings back the head of a slaughtered enemy, receives presents from the wealthy of cattle and spirituous liquor; and, if any captives are brought alive, it is the prerogative of those chieftains, who were not in the campaign, to strike off the heads of the captives. Their weapons are made by particular tribes; for some of them are unable to fabricate instruments of war.

In regard to their civil institutions; the whole management of their household affairs belongs to the women; while the men are employed in clearing forests, building huts, cultivating land, making war, or hunting game and wild beasts. Five days (they never reckon by months or years) after the birth of a male child, and three days after that of female, they entertain their family and kinsmen with boiled rice and fermented liquor; and the parents of the child partake of the feast; they begin the ceremony with fixing a pole in the court yard; and, then, killing a *gayál* or a hog with a lance, they consecrate it to their deity; after which all the party eat the flesh and drink liquor, closing the day with a dance and with songs. If any one among them be so deformed, by nature or by accident, as to be unfit for the propagation of his species, he gives up all thought of keeping house, and begs for his subsistence, like a religious mendicant, from door to door, continually dancing and singing. When such a person goes to the house of a rich and liberal man, the owner of the house usually strings together a number of red and white stones, and fixes one end of the string on a long cane, so that the other end may hang down to the ground ; then, paying a kind of superstitious homage to the pebbles, he gives alms to the beggar ; after which he kills a *gayál* and a hog, and some other quadrupeds, and invites his tribe to a feast : the giver of such an entertainment acquires extraordinary fame in the nation ; and all unite in applauding him with every token of honour and reverence.

When a *Cúcì* dies, all his kinsmen join in killing a hog and a *gayál ;* and, having boiled the meat, pour some liquor into the mouth of the deceased, round whose body they twist a piece of cloth by way of shroud : all of them taste the same liquor as an offering to his soul ; and this ceremony they repeat at intervals for several days. Then they lay the body on a stage, and, kindling a fire under it, pierce it with a spit and dry it : when it is perfectly dried, they cover it with two or three folds of cloth ; and, enclosing it in a little case within a chest, bury it under ground. All the fruits and flowers, that they gather within a year after the burial, they scatter on the grave of the deceased ; but some bury their dead in a different manner ; covering them first with a shroud, then with a mat of woven reeds, and hanging them on a high tree. Some, when the flesh is decayed, wash the bones, and keep them dry in a bowl, which they open on every sudden emergence ; and, fancying themselves at a consultation with the bones, pursue whatever measures they think proper ; alledging, that they act by the command of their departed parents and kinsmen. A widow is obliged to remain a whole year near the grave of her husband ; where her family bring her food : if she die within the year, they mourn for her ; if she live, they carry her back to her house, where all her relations are entertained with the usual feast of the *Cúcì's.*

If the deceased leave three sons, the eldest and the youngest share all his property ; but the middle son takes nothing : if he have no sons, his estate goes to his brothers, and, if he have no brothers, it escheats to the chief of the tribe.

NOTE.

A party of *Cúcì's* visited the late CHARLES CROFTES Esq. at *Jâfarabàd* in the spring of 1776, and entertained him with a dance: they promised to return after their harvest, and seemed much pleased with their reception.

XIII.

On the SECOND CLASSICAL BOOK *of the* CHINESE.

By the PRESIDENT.

THE vicinity of *China* to our *Indian* territories, from the capital of which there are not more than *six hundred miles* to the province of YU'NA'N, must necessarily draw our attention to that most ancient and wonderful Empire, even if we had no commercial intercourse with its more distant and maritime provinces; and the benefits, that might be derived from a more intimate connexion with a nation long famed for their useful arts and for the valuable productions of their country, are too apparent to require any proof or illustration. My own inclinations and the course of my studies lead me rather to consider at present their *laws*, *politics*, and *morals*, with which their general literature is closely blended, than their manufactures and trade; nor will I spare either pains or expense to procure translations of their most approved *law-tracts*; that I may return to *Europe* with distinct ideas, drawn from the fountain-head, of the wisest *Asiatic* legislation. It will probably be a long time before accurate returns can be made to my inquiries concerning the *Chinese Laws*; and, in the interval, the Society will not, perhaps, be displeased to know, that a translation of a most venerable and excellent work may be expected from *Canton* through the kind assistance of an inestimable correspondent.

According to a *Chinese* Writer, named LI YANG PING, ‘the ‘ancient characters used in his country were the outlines of visible ‘objects earthly and celestial; but, as things merely intellectual ‘could not be expressed by those figures, the grammarians of *China* ‘contrived to represent the various operations of the mind by meta‘phors drawn from the productions of nature: thus the idea of ‘roughness and of rotundity, of motion and rest, were conveyed to ‘the eye by signs representing a mountain, the sky, a river and the ‘earth; the figures of the sun, the moon, and the stars, differently ‘combined, stood for smoothness and splendour, for any thing art-

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'fully wrought, or woven with delicate workmanship; extension, growth, increase, and many other qualities were painted in characters taken from clouds, from the firmament, and from the vegetable part of the creation; the different ways of moving, agility and slowness, idleness and diligence, were expressed by various insects, birds, fish, and quadrupeds: in this manner passions and sentiments were traced by the pencil, and ideas not subject to any sense were exhibited to the sight; until by degrees new combinations were invented, new expressions added; the characters deviated imperceptibly from their primitive shape, and the *Chinese* language became not only clear and forcible, but rich and elegant in the highest degree.'

In this language, so ancient and so wonderfully composed, are a multitude of books abounding in useful, as well as agreeable, knowledge: but the highest class consists of *Five* works; one of which at least every *Chinese*, who aspires to literary honours, must read again and again, until he possess it perfectly.

The *first* is purely *Historical*, containing annals of the empire from the *two thousand three-hundred thirty-seventh* year before CHRIST; it is entitled SHÚ KING, and a version of it has been published in *France*; to which country we are indebted for the most authentic and most valuable specimens of *Chinese* History and Literature, from the compositions, which preceded those of HOMER, to the poetical works of the present Emperor, who seems to be a man of the brightest genius and the most amiable affections. We may smile, if we please, at the levity of the *French*, as they laugh without scruple at our seriousness; but let us not so far undervalue our rivals in arts and in arms, as to deny them their just commendation, or to relax our efforts in that noble struggle, by which alone we can preserve our own eminence.

The Second Classical work of the *Chinese* contains *three hundred* Odes, or short Poems, in praise of ancient sovereigns and legislators, or descriptive of ancient manners, and recommending an imitation of them in the discharge of all public and domestic duties: they abound in wise maxims, and excellent precepts. 'their whole doctrine, according to *Cun-fu-tsu*, in the LÚNYÚ or *Moral Discourses*, being reducible to this grand rule, that we should not even entertain a thought of any thing.

or culpable ;' but the copies of the SHI′ KING, for that is the title of the book, are supposed to have been much disfigured, since the time of that great Philosopher, by spurious passages and exceptionable interpolations ; and the style of the Poems is in some parts too metaphorical, while the brevity of other parts renders them obscure ; though many think even this obscurity sublime and venerable, like that of ancient cloysters and temples, '*Shedding*, as MILTON expresses it, *a dim religious light*.' There is another passage in the LU′NYU′, which deserves to be set down at length : 'Why my sons, do you not study the book of Odes ? 'If we creep on the ground, if we lie useless and inglorious, 'those poems will raise us to true glory ; in them we see, as in 'a mirror, what may best become us, and what will be unbecom-'ing ; by their influence we shall be made social, affable, bene-'volent ; for, as music combines sounds in just melody, so the 'ancient poetry tempers and composes our passions : the Odes 'teach us our duty to our parents at home, and abroad to our 'prince ; they instruct us also delightfully in the various produc-'tions of nature.' 'Hast thou studied, said the Philosopher to 'his son PEYU, the first of the three hundred Odes on the nuptials 'of Prince VE′NVA′M and the virtuous TAI-SU ? He, who studies 'them not, resembles a man with his face against a wall, unable 'to advance a step in virtue and wisdom.' Most of those Odes are near *three thousand* years old, and some, if we give credit to the *Chinese* annals, considerably older ; but others are somewhat more recent, having been composed under the later Emperors of the *third* family, called SHEU. The work is printed in *four* volumes ; and, towards the end of the *first*, we find the Ode, which COUPLET has accurately translated at the beginning of the TA′ HIO, or *Great Science*, where it is finely amplified by the Philosopher ; I produce the original from the SHI′ KING itself, and from the book, in which it is cited, together with a double version, one verbal and another metrical ; the only method of doing justice to the poetical compositions of the *Asiatics*. It is a panegyric on VUCU′N, Prince of *Guey* in the province of *Honang*, who died, near a century old, in the *thirteenth* year of the Emperor PINGVANG, *seven hundred and fifty-six years* before the birth of CHRIST, or *one hundred* and *forty-eight* according

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to Sir ISAAC NEWTON, after the taking of *Troy*, so that the *Chinese* Poet might have been contemporary with HESIOD and HOMER, or at least must have written the Ode before the *Iliad* and *Odyssey* were carried into *Greece* by LYCURGUS.

A CHINESE ODE.

瞻彼淇澳菉竹猗猗
有斐君子如切如磋
如琢如磨瑟兮僩兮
赫兮咺兮有斐君子
終不可諠

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The verbal translation of the thirty-two original characters is this:

‘[1]Behold [2]yon [4]reach of *the river* [3]Ki ;
‘Its [5]green [6]reeds how [7]luxuriant ! how [8]luxuriant !
‘Thus [9]is [11][12]our Prince [10]adorned with virtues ;
‘[13]As a [14]carver, [15]as a [16]filer, of ivory,
‘[17]As a [18]cutter, [19]as a [20]polisher, of gems.
‘O how [21]elate and sagacious ! O how [22]dauntless and composed !
‘How [23]worthy of fame ! How [24]worthy of reverence !
‘[25]We have [27]a [28]Prince [26]adorned with virtues,
‘Whom to the [29]end *of* [30]*time* [31]we can [32]not forget’

The PARAPHRASE.

Behold, where yon blue riv’let glides
Along the laughing dale ;
Light reeds bedeck its verdant sides,
And frolic in the gale :

So shines our Prince ! In bright array
The Virtues round him wait ;
And sweetly smil’d th’ auspicious day,
That rais’d Him o’er our State.

As pliant hands in shapes refin’d
Rich iv’ry carve and smoothe,
His *Laws* thus mould each ductile mind,
And every pason soothe.

As gems are taught by patient art
 In sparkling ranks to beam,
With *Manners* thus he forms the heart,
 And spreads a gen'ral gleam.

What soft, yet awful, dignity!
 What meek, yet manly, grace!
What sweetness dances in his eye,
 And blossoms in his face!

So shines our Prince! A sky-born crowd
 Of Virtues round him blaze:
Ne'er shall Oblivion's murky cloud
 Obscure his deathless praise.

The prediction of the Poet has hitherto been accomplished; but he little imagined, that his composition would be admired, and his Prince celebrated in a language not then formed, and by the natives of regions so remote from his own.

In the *tenth* leaf of the TA' HIO a beautiful comparison is quoted from another Ode in the SHÍ KING, which deserves to be exhibited in the same form with the preceding:

'The [1]peach-tree, how [2]fair! how [3]graceful!

'[4]Its [5]leaves, how [6]blooming! how [7]pleasant!

'Such is [8]a [9]bride, [10]when she [11]enters her bridegroom's house,

'And [12]pays due attention to [13]her [14]whole [15]family.'

The simile may thus be rendered:

Gay child of Spring, the garden's queen,
   Yon peach-tree charms the roving sight:
Its fragrant leaves how richly green!
   Its blossoms how divinely bright!

So softly smiles the blooming bride
   By love and conscious Virtue led
O'er her new mansion to preside,
And placid joys around her spread.

The next leaf exhibits a comparison of a different nature, rather sublime than agreeable, and conveying rather censure than praise:

[1]O how horridly impends [2]yon [3]southern [4]mountain!

[5]Its [6]rocks in how vast, how [7]rude [8]a heap!

Thus [9]loftly thou [10]sittest, O [11]minister of [12]YN;

[14]All the [13]people look up to [15]thee with [16]dread.

Which may be thus paraphrased:

See, where yon crag's imperious height
   The sunny highland crowns,
And, hideous as the brow of night,
   Above the torrent frowns!

So scowls the Chief, whose will is law,
   Regardless of our state;
While millions gaze with painful awe,
   With fear allied to hate.

It was a very ancient practice in *China* to paint or engrave moral sentences and approved verses on vessels in constant use; as the words RENEW THYSELF DAILY were inscribed on the bason of the Emperor TANG, and the poem of KIEN LONG, who is now on the throne, in praise of Tea, has been published on a set of porcelain cups; and, if the description just cited of a selfish and insolent statesman were, in the same manner, constantly presented to the eyes and attention of rulers, it might produce some benefit to their subjects and to themselves; especially if the comment of TSEM TSU, who may be called the XENOPHON, as CUN FU´ TSU′ was the SOCRATES, and MEM TSU the PLATO, of *China*, were added to illustrate and enforce it.

If the rest of the *three hundred* Odes be similar to the specimens adduced by those great moralists in their works, which the *French* have made public, I should be very solicitous to procure our nation the honour of bringing to light the *second* Classical book of the *Chinese*. The *third*, called YEKING, or the book of Changes, believed to have been written by FO, the HERMES of the East, and consisting of right lines variously disposed, is hardly intelligible to the most learned *Mandarins*; and CUN FU´ TSU′ himself, who was prevented by death from accomplishing his design of elucidating it, was dissatisfied with all the interpretations of the earliest commentators. As to the *fifth*, or LIKI, which that excellent man compiled from old monuments, it consists chiefly of the *Chinese* ritual, and of tracts on Moral Duties; but the *fourth* entitled CHUNG CIEU, or *Spring* and *Autumn*, by which the same incomparable writer meaned the *flourishing* state of an Empire, under a virtuous monarch, and the *fall* of kingdoms, under bad governors, must be an interesting work in every nation. The powers, however, of an individual are so limited, and the field of knowledge is so vast, that I dare not promise more, than to procure, if any exertions of mine will avail, a complete translation of the SHI′ KING, together with an authentic abridgement of the *Chinese* Laws, civil and criminal. A native of *Canton*, whom I knew some years ago in *England*, and who passed his first examinations with credit in his way to literary distinctions, but was afterwards allured from the pursuit of learning by a prospect of success in trade, has favoured me with the *Three Hundred Odes* in the original, together with the LÚN YÚ, a faithful version of which was published at *Paris* near a century ago; but he seems to think, that it would require three or four years to complete a translation of them; and Mr. COX informs me, that none of the *Chinese*, to whom he has access, *possess leisure and perseverance enough for such a task;* yet he hopes, with the assistance of WHANG ATONG, to send me next season some of the poems translated into *English.* A little encouragement would induce this young *Chinese* to visit *India*, and some of his countrymen would, perhaps, accompany him; but, though considerable advantage to the public, as well as to letters, might be reaped from the knowledge and ingenuity of such emigrants, yet we must wait for a time of greater national wealth and prosperity, before such a measure can be formally recommended by us to our patrons at the helm of government.

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A Letter to the PRESIDENT *from a young* CHINESE.

SIR,

I RECEIVED the favour of your letter dated 28th March 1784 by Mr. COX. I remember the pleasure of dining with you in company with Capt. BLAKE and Sir JOSHUA REYNOLDS ; and I shall always remember the kindness of my friends in *England.*

The *Chinese* book, SHI′ KING, that contains three hundred Poems, with remarks thereon, and the work of *Con-fu-tsu*, and his grandson, the *Tai Ho*, I beg you will accept ; but to translate the work into *English* will require a great deal of time ; perhaps three or four years ; and I am so much engaged in business, that I hope you will excuse my not undertaking it.

If you wish for any books or other things from *Canton*, be so good as to let me know, and I will take particular care to obey your orders.

Wishing you health,
I am, SIR,
Your most obedient humble Servant,
WHANG ATONG.

To Sir WILLIAM JONES.
Dec. 10, 1784.

XIV.

A TABLE,

Containing Examples *of all the different species of* Infinitives *and* Participles *that are derived from* Triliteral Verbs, *in the form in which they are used in the* Persian *and in the Language of* Hindostan.

ARABIC TRILITERAL VERBS.

			CONJUGATION 1st.	From	2nd.	From	3rd.	From	4th.	From
I. With three different radicals, none of them, as فعل	ادبي	Infin.	فعل action,	فعل	تقصير fault,	قصر	مخالفت opposition,	حلف	اظهار demonstration,	ظهر
		Part. act.	حاكم judging,	حكم	مصدع importuning,	صدع	مطابق conforming,	طبق	مهلک destroying,	هلک
		Part. pas.	مقتول slain,	قتل	مكسر broken;	كسر	مناسب connected,	نسب	مطلق absolved,	طلق
II. With the 2nd and 3rd radicals the same, but none of them, as عز	ادبي	Infin.	عز honor,	عز	تكرير repetition,	كر	ممادت extension,	مد	اقرار confirmation,	قر
		Part. act.	حاج performing the pilgrimage,	حج	محقق certifying,	حق	ممادّ extending,	مدّ	معز honoring,	عز
		Part. pas.	مذموم blamed,	ذم	مكرر repeated,	كر	مضادّ opposed,	ضدّ	معدّ prepared,	عدّ
III. With ا for the 1st radical, as	ادب	Infin.	ادب civility,	ادب	تاديب instruction,	ادب	مواخرت procrastination,	اخر	ايثار presentment,	اثر
		Part. act.	آكل eating,	اكل	موصّل establishing,	اصل	موارف lying contiguous,	ارف	مؤكل giving to eat,	اكل
		Part. pas.	ماخوذ taken,	اخذ	مودب well educated,	ادب	موانس familiarized,	انس	مولم pained,	الم
IV. With ا for the 2nd radical, as	شان	Infin.	شان condition,	شان	تلييم mitigation,	لام	ملاامت complacency,	لام	اسالت compliance,	سال
		Part. act.	سائل interrogating,	سال						سال
		Part. pas.	مسؤل sought,	سال	ملاءم clothed in mail,	لام			مفام filled,	فام
V. With ا for the 3rd radical, as	برا	Infin.	براء relief, cure,	برأ	تهنيت congratulation,	هنا			ابراء relief,	برا
		Part. act.	باري creating,	برأ	مبري free,	برء			مبني causing to build,	بنا
		Part. pas.	مبري freed,	برأ	مهنا congratulated,	هنا			منشا erected,	نشا
VI. With و for the 1st radical, as	وضع	Infin.	وضع situation,	وضع	توفيق concurrence,	وفق	مواظبت perseverance,	وظب	ايجاب necessity,	وجب
		Part. act.	واصل arriving,	وصل	موكد confirming,	وكد	موافق agreeing,	وفق	موجب causing,	وجب
		Part. pas.	موضوع placed,	وضع	موفق assisted,	وفق			موجد confirmed,	وجد
VII. With و for the 2nd radical, as	قول	Infin.	قول speech,	قول	تطويل prolixity,	طول	مداومت continuation,	دوم	اجازت permission,	جوز
		Part. act.	قايل speaking,	قول	منور illuminating,	نور	مقاوم rising against another,	قوم	مقيم continuing,	قوم
		Part. pas.	مخوف dreaded,	خوف	مطول extended,	طول			مجاز permitted,	جوز
VIII. With و for the 3rd radical, as	سهو	Infin.	سهو omission,	سهو	تربيت education,	ربو	ملاقات interview,	لقو	انشا composition,	نشو
		Part. act.	عادي transgressing,	عدو	مربي instructing,	ربو	ملاقي meeting,	لقو	منشي a Moonshy, a composer, composing,	نشو
		Part. pas.	مدعو & مدعي solicited,	دعو	مربا instructed,	ربو			ملقا thrown,	لقو
IX. With ي for the 1st radical, as	يقن	Infin.	يقن certainly,	يقن	تيسير the act of facilitating	يسر	ميامنت the act of blessing,	يمن	ايقان certain knowledge,	يقن
		Part. act.	يامن prospering,	يمن	ميمن enjoying prosperity,	يمن			موقن certain,	يقن
		Part. pas.	ميمون favoured by fortune,	يمن	ميسر obtained,	يسر				
X. With ي for the 2nd radical, as	سير	Infin.	سير the act of walking out,	سير	تغيير alteration,	غير	مغايرت the act of changing,	غير	اضافت relation,	ضيف
		Part. act.	مائل inclining.	ميل	مخير choosing,	خير	مغاير opposing,	غير	مخيم pitching a tent,	خيم
		Part. pas.	مبيع sold,	بيع	مغير changed,	غير			مضاف annexed,	ضيف
XI. With ي for the 3rd radical, as	بغي	Infin.	بغي injustice,	بغي	تثنيه the act of doubling,	ثني	مكافات compensation,	كفي	انها the act of announcing,	نهي
		Part. act.	قاضي judging,	قضي	مصلي praying,	صلي	منافي repugnant,	نفي	منهي reporting,	نهي
		Part. pas.	مقضي determined,	قضي	مثنا doubled,	ثني			مغشا covered over,	غشي
		Infin.	ارب attract,	ارب	تاويل explication,	اول				

		Part. pas.	favoured by fortune,		fault......					
X. With ي for the 2nd radical, as	سير	Infin.	سَيْر the act of walking out,	سير	تَغْيِير alteration,	غير	مُغَايَرَت the act of changing,	غير	إضَافت relation,	ضيف
		Part. act.	مَائِل inclining.	ميل	مُخَيِّر choosing,	خير	مُغَايِر opposing,	غير	مُخَيِّم pitching a tent,	خيم
		Part. pas.	مَبِيع sold,	بيع	مُغَيَّر changed,	غير			مُضَاف annexed,	ضيف
XI. With ي for the 3rd radical, as	بغي	Infin.	بَغْي injustice,	بغي	تَثْنِيَة the act of doubling,	ثني	مُكَافَات compensation,	كفي	إنْهَا the act of announcing,	نهي
		Part. act.	قَاضِي judging,	قضي	مُصَلِّي praying,	صلي	مُنَافِي repugnant,	نفي	مُنْهِي reporting,	نهي
		Part. pas.	مَقْضِي determined,	قضي	مُثَنَّا doubled,	ثني			مُغَشَّا covered over,	غشي
XII. With ا for the 1st, and و the 2nd radical, as	اوب	Infin.	أَوْب attract,	اوب	تَأْوِيل explication,	اول				
		Part. act.	أَيِّد troublesome,	اود	مُؤَوِّل explaining,	اول				
		Part. pas.	مَأْوُوف hurt,	اوف	مُؤَوَّل translated,	اول			مُؤَوَّد weighed down,	اود

A TABLE CONTAINING EXAMPLES &c.

5th.	From	6th.	From	7th.	From	8th.	From	10th.	From
تکبر arrogance,	کبر	تغافل negligence,	غفل	إنکسار contrition,	کسر	إنتظام regulation,	نظم	إستقبال a meeting,	قبل
متصرف possessing,	صرف	متعاقب succeeding another,	عقب	مندرج comprehending & comprehended,	درج	منتظر expecting,	نظر	مستحفظ protecting,	حفظ
متعلق annexed,	علق	متباعد removed,	بعد			منتظم regulated,	نظم	مستحکم confirmed,	حکم
تجسس investigation,	جس	تداقق mutual search,	دق	إنحلال solution,	حل	إهتمام solicitude,	هم	إستقلال independency,	قل
متردد opposing,	رد	تحاج disputation,	حج	منهل flowing profusely,	هل	مشتد wearing out,	شد	مستقل absolute,	قل
متضرر injured,	ضر	متراد opposing each other,	رد			مختل depraved,	خل	مستمر past,	مر
تأمل deliberation,	امل	متماس touched,	مس			إئتمان confidence,	امن	إستئصال extirpation,	اصل
متأخر retarding,	اخر					مؤتمن confiding,	امن	مستأدب studying civility,	ادب
	فال					مؤتمن confided,	امن	مستأصل eradicated,	اصل
تسيل the act of begging,	سال	تساءل expostulation,	سال			إفتئال auguration,	فال		
متسول or متسائل begging,		متسائل begging,	سال						
	سال	متفائل portended,	فال						
تهنؤ refreshing with good food,	هنا					إبتدا commencement,	بدأ	إستبرا purification.	براء
متبري freeing,	برا	متباهي boasting mutually,	بها			مبتدي beginning,	بدأ	مستبري desiring to be free,	براء
متهنا congratulated,	هنا					مبتدا begun,	بدأ		
توقف delay,	وقف	تواضع submission,	وضع			إتحاد union,	وحد	إستيطان residence,	وطن
متوجه giving countenance,	وجه	متواتر succeeding another,	وتر			متصل approaching,	وصل	مستوطن residing,	وطن
متوقع expected,	وقع	متواصل united,	وصل			متحد united,	وحد	مستودع deposited,	ودع
تصور the act of imagining,	صور	تجاوز excess,	جوز	انقیاد submission,	قود	إشتياق affection,	شوق	إستصواب approbation,	صوب
متصور imagining,	صور	متجاوز exceeding,	جوز	منقاد obeying,	قود	مشتاق desiring,	شائق	مستطيل exalting himself,	طول
متصور imagined,	صور	متعاور received in loan,	عور			مشتاق desired,	شوق	مستعار received in loan,	عور
تعدي violence,	عدو	تلاغي prosecution,	لغو	إنجلا brightness,	جلو	إلتقا conference,	لقو	إستدعا the act of petitioning,	دعو
متعدي transgressing,	عدو	متعالي raising on high,	علو	متعدي contagious,	عدو	ملتقي coming to meet.	لقو	مستعدي desiring aid to oppose,	عدو
متلقا met,	لقو					مبتلا afflicted,	بلو	مستدعا solicited,	دعو
تيمن the act of making happy,	يمن	تياجر the act of revolting,	يجر			إيتقان the act of ascertaining,	يقن	إستيسار the act of facilitating,	يسر
متيقن ascertaining,	يقن	متياجر revolting,	يجر					مستيقن exploring,	يقن
متيقظ roused,	يقظ	متياجر revolted,	يجر						
تقيد application,	قيد	تمايل inflection,	ميل	انقیاد submission,	قيد	إختيار option,	خير	إستمالت the act of soothing,	ميل
متخير wondering,	خير	متغاير altering,	غير	منقاد obeying,	قيد	مختار choosing,	خير	مستفيد acquiring gain,	فيد
متعين appointed,	عين					مختار chosen,	خير	مستزاد increased,	زيد
تعصي rebellion,	عصي	تعالي exaltation,	علي	إنقضا expiration of time,	قضي	إكتفا sufficiency,	كفي	إستقضا appeal for judgment,	قضي
متمني wishing,	مني	متناهي completing,	نهي	منقضي coming to a conclusion,	قضي	مقتضي requiring,	قضي	مستغني enjoying plenty.	غني
متمنا wished.	مني					مقتضا required,	قضي	مستثنا excepted,	ثني
تأول exposition,	اول								
متأول interpreting,	اول								
متأول translated,	اول					مؤتاب returning,	ارب	مستنفر taking fright,	نفر
						مؤتاب returned,		مستنفر affrighted,	

تَيَمُّن the act of making happy,	يمن	تَيَاجُر the act of revolting,	يجر			إِيتِقَان the act of ascertaining,	يقن	إِسْتِيسَار the act of facilitating,	يسر
مُتَيَقِّن ascertaining,	يقن	مُتَيَاجِر revolting,	يجر					مُسْتَيْقِن exploring,	يقن
مُتَيَقِّظ roused,	يقظ	مُتَيَاجَر revolted,	يجر						
تَقَيُّد application,	قيد	تَمَايُل inflection,	ميل	إِنْقِيَاد submission,	قيد	إِخْتِيَار option,	خير	إِسْتِمَالَت the act of soothing.	ميل
مُتَخَيِّر wondering,	خير	مُتَغَايِر altering,	غير	مُنْقَاد obeying,	قيد.	مُخْتَار choosing,	خير	مُسْتَفِيد acquiring gain,	قيد
مُتَعَيِّن appointed,	عين					مُخْتَار chosen,	خير	مُسْتَزَاد increased,	زيد
تَعَصِّي rebellion,	عصي	تَعَالِي exaltation,	علي	إِنْقِضَا expiration of time,	قضي	إِكْتِفَا sufficiency,	كفي	إِسْتِقْضَا appeal for judgment,	قضي
مُتَمَنِّي wishing,	مني	مُتَنَاهِي completing,	نهي	مُنْقَضِي coming to a conclusion,	قضي	مُقْتَضِي requiring,	قضي	مُسْتَغْنِي enjoying plenty.	غني
مُتَمَنَّا wished.	مني					مُقْتَضَا required,	قضي	مُسْتَثْنَا excepted,	ثني
تَأَوُّل exposition,	اول								
مُتَأَوِّل interpreting,	اول					مُؤْتَاب returning,	اوب	مُسْتَاوِر taking fright,	اور
مُتَأَوَّل translated,	اول					مُؤْتَاب returned.	اوب	مُسْتَاوَر affrighted,	اور

A TABLE CONTAINING EXAMPLES, &c.

From Arabic Triliteral Verbs.

			Conjugation 1st.	From	2nd.	From	3rd.	From	4th.	From
XIII. With ا for the 1st, and ي the 2d radical, as	ايد	Infin.	اَيْد strength,	ايد	تائيد confirmation,	ايد				
		Part. act.	آيِد potent,	ايد	مؤيِّد confirming	ايد			مؤيد confirming,	ايد
		Part. pas.	مايوس made desperate,	ايس	مؤيَّد confirmed,	ايد			مؤيد confirmed,	ايد
XIV. With ا the 3d, and و the 2d radical, as	سوء	Infin.	سوء depravity,	سوء	تسوية accusation,	سوء	مسايئت evil doing,	سوء	اساءت evil doing,	سوء
		Part. act.							مسي sinning,	سوء
		Part. pas.								
XV. With ا the 3d, and ي the 2d radical,	جيء	Infin.	هيّ the act of calling to eat and drink,	هيء	تهيئة preparation,	هيء				
		Part. act.	جائي coming,	جيء	مهيّء preparing,	هيء				
		Part. pas.			مهيّا prepared,	هيء				
XVI. With ا the 1st, and و the 2d radical,	اخو	Infin.	اسو medicine,	اسو	تابية the act of calling 'father,'	ابو	مواخات the cultivation of friendship,	اخو		
		Part. act.	آسي curing,	اسو	موسّي giving comfort,	اسو			موسي giving comfort,	اسو
		Part. pas.	ماسو cured,	اسو						
XVII. With ا the 1st, and ي the 3d radical,	اذي	Infin.	اذي trouble,	اذي	تادية performance,	ادي	موازات parallelism,	ازي	ايذا molestation,	اذي
		Part. act.	آذي taking trouble,	اذي	مودّي performing,	ادي	موازي parallel,	ازي	موذي molesting,	اذي
		Part. pas.			مودّ performed,	ادي				
XVIII. With ا the 2d, and ي the 2d radical, as	راي	Infin.	رأي observation,	راي			مرايات dissimulation,	راي	ارائت the act of shewing,	راي
		Part. act.	رائي observing,	راي			مرائي dissembling,	راي		
		Part. pas.	مرئي observed,	راي						
XIX. With و the 1st, and ي the 3d radical,	وقي	Infin.	وقي protection,	وقي	توقية the act of protecting	وقي	موافات the performance of what is due,	وفي	ايفاء the performance of what is stipulated,	وفي
		Part. act.	واقي protecting,	وقي	موقّي powerful,	وقي	موافي performing,	وفي	موصي making a will,	وصي
		Part. pas.	موقي protected,	وقي	موصّا directed by a will,	وصي			موفا performed,	وفي
XX. With ي the 1st, and ي the 3d radical,	يدي	Infin.	يدي power,	يدي			ميادات payment out of one's own hand,	يدي		
		Part. act.							مودي beneficent,	يدي
		Part. pas.	ميدي hurt in the hand,	يدي					مودا benifited,	يدي
XXI. With و the 2d, and ي the 3d radical,	قوي	Infin.	قوت strength,	قوي	تقويت corroboration,	قوي	مساوات the act of making equal,	سوي		
		Part. act.	قاوي seizing,	قوي	مقوّي strengthening,	قوي	مساوي equal,	سوي	مقوي having strong cattle	قوي
		Part. pas.	مروي narrated,	روي	مقوّا strengthened,	قوي				
XXII. With ي the 2d, and ي the 3d radical, as	حيي	Infin.	حيات life,	حيي	تحيت salutation,	حيي			احياء vivification,	حيي
		Part. act.	حايي living,	حيي	محيّي saluting,	حيي			محيي vivifying,	حيي
		Part. pas.								
XXIII. With و for the 1st, and ي 2d radical,	اوي	Infin.	اوي vid. gol.							
		Part. act.	آوي vid. gol.							
		Part. pas.								
		Infin.	وأي promise,	واي						

							ميانات payment out of one's own hand,	بلي		
XX. With ي the 1st, and ي the 3d radical,	يدي	Part. act.							مُوْدِي beneficent,	يدي
		Part. pas.	مَيْدِيّ hurt in the hand,	يدى					مُوْدًا benifited,	يدي
XXI. With و the 2d, and ي the 3d radical,	قوي	Infin.	قُوَّت strength,	قوي	تَقْوِيَت corroboration,	قوي	مُسَاوَات the act of making equal,	سوي		
		Part. act.	قَارِي seizing,	قوي	مُقَوِّي strengthening,	قوي	مُسَاوِي equal,	سوي	مُقْوِي having strong cattle	قوي
		Part. pas.	مَرْوِي narrated,	روي	مُقَوًّا strengthened,	قوي				
XXII. With ي the 2d, and ي the 3d radical, as	حيي	Infin.	حَيَات life,	حيي	تَحِيَّت salutation,	حيي			اِحْيَاء vivification,	حيي
		Part. act.	حَايِي living,	حيي	مُحَيِّي saluting,	حيي			مُحْيِي vivifying,	حيي
		Part. pas.								
XXIII. With و for the 1st, and ي 2d radical,	اري	Infin.	اَرْي vid. gol.							
		Part. act.	آرِي vid. gol.							
		Part. pas.								
XXIV. With و the 1st, and ي the 3d radical,	واي	Infin.	وَاْي promise,	واي						
		Part. act.								
		Part. pas.								

A TABLE CONTAINING EXAMPLES, &c.

5th.			6th.			7th.			8th.			10th.		
		From			From			From			From			From
تَايُّد	confirmation,	ايد												
مُتَايِّد	confirming,	ط												
مُتَايِّض	made soft,	ايض												
تَهَيُّؤ	preparation,	هيء												
مُتَهَيِّئ	preparing,	هيء												
مُتَهَيَّا	prepared,	هيء												
تَآخِي	behaviour of a brother,	اخو	تَآخِيْ	mutual fraternity,	اخو									
مُتَآخِي	acting like a brother,	اخو	مُتَآخِيْ	behaving mutually like brothers,	اخو				مُؤْتَمِي	imitating,	امو			
تَأَنِّي	caution,	اني										مُسْتَانِيْ	waiting with patience,	اني
مُتَأَنِّي	cautious,	اني												
			مُتَرَائِيْ	looking at one another,	راي									
تَوَفِّيْ	the act of fulfilling,	وفي	تَوَالِيْ	a series of succession,	ولي				اِتِّقَا	abstinence,	وقي	اِسْتِيفَا	the act of fulfilling,	وفي
مُتَوَفِّيْ	giving up life,	وفي	مُتَوَالِيْ	following in succession,	ولى				مُتَّقِيْ	abstinent,	وقي	مُسْتَوْفِيْ	fulfilling,	وفي
مُتَوَفَّا	deceased,	وفي												
تَقَوِّيْ	superior strength,	قوي	تَقَاوِيْ	the act of empowering,	قوي				اِسْتِوَا	equality,	سوي			
مُتَقَوِّيْ	having great strength,	قوي	مُتَقَاوِيْ	empowering,	قوي				مُسْتَوِيْ	equal,	سوي			
												اِسْتِحْيَا	modesty,	حيي
مُتَاوِّيْ	collecting together,	اوي							مُؤْتَوِيْ	receiving into his house,	اوي			

ADVERTISEMENT.

EXAMPLES of derivatives from Arabic quadriliterals rarely occur in the Persian language; and from the 9th, 11th, 12th, and 13th conjugations of triliterals there are none to be met with. I have, therefore, confined my observations to the nine conjugations included in the Table. And although particular senses and uses are assigned to each of these by grammarians, (which may be seen in Mr. *Richardson's* Gram. p. 65) it is at the same time to be observed, that they are nevertheless frequently used in other senses; many of them retaining the simple signification of their premitives: and that every root does not extend through every conjugation, but that some are used in one form, many in several, none in all.

These observations are applicable to the present subject; and the derivatives of such conjugations as are more frequently used in the Arabic, seem also to be more frequently than any other introduced into the Persian.

Where no example of any particular form is to be found in Golius and Meninski, I have left a blank in the Table, which may be filled up whenever any can be met with.

With regard to the examples which I have brought to illustrate the following rules, they are such as came first to hand; and *one* example of an infinitive or participle is intended as a representation of the infinitives and participles of every species and conjugation. To have attempted a complete system of examples would have carried me far beyond the limits of my present undertaking.

OF ARABIC INFINITIVES.

I. Their Masculine Singulars are used in the Persian as Substantives ; and in every respect serve the same purposes, and are subject to the same rules of construction as substantives originally Persian.

Ex.

1. governing a sub. fol,	اظهارِ یکانگي	demonstrations of unanimity
2. agreeing with an ad. fol,	استعجالِ تمام	great haste
3. agreeing with a part. pas. fol.	تحریرِ مسطور	the said writing
4. nominatives to verbs,	نظر براین بود	my view was this
5. governed by verbs,	احتظاظِ وافر یافت	he received great delight
6. governed by a preposition,	بعد از تقدیمِ مراسم	after performing the duties
7. united by conjunction,	اقبال و اجلال	prosperity and splendor
8. rendered definite by affixing ي	اتّحادي که درمیان بود	the union that was between

II. Their Masculine Plurals are used in the Persian as substantives ; and in every respect serve the same purposes, and are subject to the same rules of construction as substantives originally Persian.

Ex.

1. governing a sub. fol,	اخلاقِ مردم	the dispositions of men.

Ex.

2. agreeing with an ad. fol.	افعالِ نیک	good actions
3. agreeing with a part. pas. fol.	اطوارِ مسطور	the qualifications described

III. Their Feminine Singulars are used in the Persian as substantives ; and in every respect serve the same purposes, and are subject to the same rules of construction as substantives originally Persian.

Ex.

1. nominatives to verbs,	اجازت است	there is permission
2. governing a sub. fol.	معاملتِ ملک	the business of the empire
3. agreeing with an ad. fol.	مقاتلهٔ عظیمه	a bloody battle
4. agreeing with a part. pas. fol.	مکاتبهٔ مرقومه بدوستي	a letter written in friendship

IV. Their Feminine Plurals are used in the Persian as substantives ; and in every respect serve the same purposes, and are subject to the same rules of construction as substantives originally Persian.

Ex.

1. governing a sub. fol.	توجهاتِ دوستان	the civilities of friends
2. agreeing with an ad. fol.	معاملاتِ کلّي	public affairs
3. agreeing with a part. pas. fol.	تکلیفاتِ مزبور	the said burthens

V. The Infinitives of the first conjugation of transitive verbs are regularly of the the form exhibited in the Table. But those of

Intransitives are reducible to no proper rule without innumerable exceptions. Grammarians make of them in all thirty-two different forms, which may be seen in Mr. Richardson's Gramar, p. 92: but for these irregularities, he justly observes, that a dictionary is the only proper guide. These Infinitives, both Singulars and Plurals, are introduced freely into the Persian as Substantives.

Ex.

governing another sub. fol.	وصلِ مکتوب	the arrival of the letter & ca & ca.

OF ARABIC PARTICIPLES ACTIVE.

I. Their Masculine Singulars are used in the Persian as participles, as substantives, and as adjectives.

Ex.

1. as participles with a verb fol.	منتظر ماند	he remained expecting
	طالع و لامع باد	be shining and blazing
2. as sub. governing another sub. fol.	حاکمِ شهر	governor of the city
	موجبِ خوشنودی	causing gladness —the cause of gladness
	مصنّفِ این کتاب	composing this book—the author of this book
	مطابقِ شرعِ شریف	following the noble law—follower of the noble law
3. as an ad. qualifying a sub.	مردمِ قابل	an able man
4. following another sub. signifying the same thing	حضرتِ خالق	God the creator

Ex.

5. agreeing with an ad. fol.	عامل نیک	a good agent
6. agreeing with a part. pas. fol.	حاکمِ مستقلّ	absolute judge
7. governed by a verb,	قاتل را کشت	he put the murderer to death
8. nominatives to verbs,	اگر عاشقِ صادق است	if the lover be sincere
9. with a preposition. fol. an uncommon construction,	مشتمل بر مصادقت	containing friendship

II. Their masculine perfect plurals are used in the Persian as substantives in the form of the oblique case which terminates in ین. But they do not seem to be used in the form of the nominative which terminates in ون.

Ex.

1. governed by a sub. going before,	علمِ اوّلین و اخرین	the knowledge of the moderns and ancients
	قومِ مسلمین	the sect of the faithful

III. Their masculine imperfect plurals are used in the Persian as substantives.

Ex.

1. governing a sub. fol.	حکّامِ حال و استقبال	officers of the present and future
2. agreeing with an ad. fol.	عمال جدید و قدیم	the new and old agents

IV. Their feminine singulars are used in the Persian as participles, as substantives, and as adjectives.

Ex.

1. as a part. act. with a verb fol.	حامله است	she is pregnant

Ex.

2. as a sub. governing another fol.	مالکهٔ ملک	queen of the empire
3. as an ad. qualifing a sub. going before,	زنِ حامله	a pregnant woman
4. as a sub. qualified by an ad. following,	مشفقهٔ مهربان	kind friend
5. as a sub. qualified by a part. pas. following,	صاحبهٔ موصوفه	accomplished lady

V. Their feminine perfect plurals are used in the Persian as substantives expressing things without life.

Ex.

1. governing a sub. fol.	واقعاتِ زمان	the incidents of time
2. agreeing with an ad. fol.	واردات ناگهاني	unforeseen events

OF ARABIC PARTICIPLES PASSIVE.

I. Their masculine singulars are used in the Persian as participles passive, as substantives, and as adjectives.

Ex.

1. as a part. pas.	جملگئ همت مصروف بران است	the sum of my desire is bestowed on that
	ظلّ شفقت ممدود باد	be the shade of clemency extended
2. as a sub. governing another fol. it,	مشهودِ ضمیرِ منیر میگرداند	I make it the perception (i. e. the thing perceived) of your enlightened soul; i. e. I represent it, &c.

Ex.

	مرغوبِ طبايع	the desire, (i. e. the thing desired) of the souls
3. as an ad. qualifying a sub. going before,	بندهٔ مظلوم	the injured slave
4. joined with another sub. by a conjunction,	مقصود و مرام	intention and design
5. governed by verbs,	خلايق را محظوظ گردانند	make the people glad
6. nominatives to verbs,	مقصودِ ايشان برين بود	their intention was this

II. Their masculine perfect plural does not seem to be used in the Persian, either in the form of the nominative or the oblique case.

III. Their feminine singulars are used in the Persian as substantives, and as adjectives.

Ex.

1. as a sub. governing another fol. it,	معشوقهٔ من	my beloved, i. e. the beloved of me
2. as a sub. agreeing with a part. pas. following,	معشوقهٔ مذكوره	the said beloved woman
3. as an ad. agreeing with a sub. going before,	والدهٔ مخدومه	respected mother

IV. Their feminine perfect plurals are used in the Persian as substantives, to express things without life.

Ex.

1. governing a sub. fol.	مطلوباتِ ان مهربان	the demands of that friend
2. agreeing with an ad. fol.	مقدماتِ شرعي	law affairs

V. The active and passive participles of transitive verbs form, with a following substantive having the article ال prefixed to it, compounds corresponding to that of خوبروي, which are used in the Persian as substantives and as adjectives.

Ex.

1. as a sub. a nominative to the verb,	متعذّر الفصل است	he evades a decision
2. as an ad. qualifying a sub.	شخصِ واجبُ التعظیم	a person deserving respect
	قلمِ مقطوعُ اللسان	a pen, cut short in the point

OF ARABIC ADJECTIVES *resembling* PARTICIPLES.

I. The forms حَسَن صَعْب شَرِير represent three species of Arabic words which are derived from intransitive verbs; and called by Arabic grammarians, adjectives resembling participles. The singulars of these forms are used in the Persian both as adjectives and substantives.

Ex.

1. as a sub qualified by the pronoun dem.	آن عزیز	that respectable person
2. with a verb,	شریر است	he is wicked
3. as an ad. qualifying a sub.	دوستِ قدیم	an old friend

II. Their plurals are used in the Persian as substantives.

Ex.

1. governing a sub. fol.	حکمأی یونان	the learned men of Greece
2. agreeing with an ad. fol.	شرفاي پاك نهاد	noblemen of integrity

III. These three forms of adjectives, resembling participles, form, with a following substantive having the article ال prefixed to it, compounds corresponding to that of خوبروي, which are used in the Persian both as substantives and adjectives.

Ex.

1. as a sub. qualified by the pro. demon.	آن حسنُ الوجه	that beauty
	آن قديمُ الخدمت	that old servant
2. as a sub. qualified by an ad. fol.	قديم الخدمتِ مذكور	the said old servant
3. as an ad. qualifying a sub. going before,	مردمِ قديم الخدمت	a man of long service

OF PARTICIPLES *expressing the Sense of their* PRIMITIVES *in a stronger Degree.*

I. The forms نِصِّير نَصّار نَصُور نَصِر مِنْصار are participles which express the sense of their primitives in a stronger degree; and are sometimes used in the Persian as adjectives.

Ex.

1. agreeing with a sub. going before,	ادويهٔ قتّاله	a poisonous medicine
2. agreeing with a verb fol.	صبور است	he is full of patience

صريب is the form of a participle expressing the sense of the primitive in a less degree; but it does not seem to be used in the Persian.

OF ARABIC SUBSTANTIVES.

I. The Arabic noun of time and place are frequently employed in the Persian; and the following list exhibits the forms of such as are derived from the first conjugations of the different species of triliterals.

CONJUGATION FIRST.

NOUNS *of* TIME *and* PLACE *from* TRILITERALS.

	FROM		ROOTS
I.	مَكْتَب	the time and place of writing,	كتب
II.	مَقَرّ	a place of rest—residence,	قرّ
III.	مَأْمَن	a place of safety,	امن
V.	مَبْدَا	the place and time of beginning,	بداء
VI.	مَوْضِع	place—opportunity,	وضع
VII.	مَقَام	the place and time of standing,	قوم
VIII.	مَدْعَا	the place or object of desire,	دعو
X.	مَبِيع	the place and time of selling,	بيع
XI.	مَرْمَا	the place and time of throwing,	رمي
XII.	مَآب	the place of return—the center,	اوب
XV.	مَجِيء	the time of coming—arrival.	جي
XVII.	ماتا	the place, the way of approaching,	اتى
XVIII.	مَرْءَا	the place of looking, beholding,	راي
XIX.	مَوْلَا و مَوْلِي	the place of power—and thus lord, master, &c.	ولي
XXI.	مَهْوَا	a place of division—the interval,	هوي
XXII.	مَحْيَا	the time and place of living,	جي
XXIII.	مَاوَا و مَاوِي	a place of habitation—refuge,	اوي

———To express the *place* more particularly, ة is sometimes added to the common form, as مقبرة a burning place.

II. The noun of time and place from the derivative conjugations is exactly the same with the participle passive; and is also used in the Persian.

Ex.

1. a part. pas. from the 10th con.	مستودع	deposited—also a place of deposit

III. The Persian language has terms proper to itself for expressing the instrument of action; it does not however reject the use of the Arabic instrumental noun, which is represented by the forms, مِنْصَرٌ مِنْصَارٌ or مِنْصَرَةٌ

Ex.

1. governing another sub. fol.	بمیزانِ عقل سنجید	he weighed in scale of reason
	مفتاحِ مقصوده	the key of his intention

IV. All Arabic proper names, and the names of things, are introduced into the Persian at pleasure.

Ex. مریم Mary, مكّه Mecca, عين the eye, لحم flesh, جدّ an ancestor, &c. &c.

OF ARABIC ADJECTIVES.

I. Besides the Arabic participles which we have already observed are used as adjectives, there is also a plentiful source of real adjectives formed by affixing ي to substantives of almost every denomination, which are freely introduced into the Persian.

Ex. انسانی humane, ارضی earthly, مصری Egyptian, &c. &c.

II. The masculine singulars of Arabic superlatives are used in the Persian both as substantives and adjectives.

Ex.

1. as a sub. governing another fol. it	اسعدِ زمان	the most fortunate of times
2. as an ad. qualifying a sub. going before,	در وقتِ احسن	at a most lucky time

III. The masculine plurals of Arabic superlatives are used in the Persian both as substantives and adjectives.

Ex.

1. as a sub. governing another fol. it,	اکابرِ وقت	the great men of the age
2. as an ad. qualifying a sub. going before,	اشخاصِ اکابر	most illustrious personages

IV. The feminine singulars of Arabic superlatives are used in the Persian as adjectives.

Ex. 1. qualifying a sub. going before,	دولتِ عظمي	prosperity most great

V. Arabic ordinal numbers are used in the Persian as adjectives.

Ex. 1. qualifying a sub. before,	بابِ اول	the first chapter.

Of the FORM *of* ARABIC WORDS *when used in the* PERSIAN.

I. All arabic infinitives, participles, substantives, and adjectives, are introduced into the Persian in the form of the nominative, which throws away from the last letter every species of nunnation (ٌ ٍ ً), or short vowel (ُ ِ َ), which they may possess as Arabic words, and remain without motion ; but when their construction in the Persian requires them to assume the termination of another case, they receive it in the same manner as if they were originally Persian words ; with the following exceptions.

1*st.* When an Arabic word terminating in ي, that must be pronounced as ا *, becomes the first substantive in construction with another substantive following it, ي is actually changed into ا, to which short ي (ِ) is afterwards affixed to shew the construction.

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* See Richardson's Arabic Gram. p. 109. Canon. III.

Ex. تمني in construction becomes تمناي, as شفاعت تمناي the petition of intercession, and so also دعوي معني مولي &c.

2*d.* Feminine Arabic *substantives* terminating in ة, when introduced into the Persian, change ة, sometimes into ه, and sometimes into ت.

Ex. محبت friendship, being found written by the same author محبه and محبت.

3*d.* Feminine Arabic *adjectives* and *participles* terminating in ت, when introduced into the Persian, always change ت into ه.

Ex. خالصت pure, is always written خالصه, as خالصه محبت pure friendship.

4*th.* Arabic participles plural terminating in ين, although introduced into the Persian as nominatives, are originally the oblique case.

Ex. دانايان متقدمين چنين فرمودند the learned ancients thus said.

5*th.* When an Arabic infinitive is used in the Persian language as an adverb, it is introduced in the form of the Arabic accusative without any change.

Ex. اتفاقا accidentally, &c. &c.

OF ARABIC ADVERBS, PREPOSITIONS, AND CONJUNCTIONS.

I. Arabic adverbs, prepositions, and conjunctions, seem to be introduced into the Persian language at pleasure. Of these Mr. Richardson has made a very useful collection in his chapter of separate particles, to which I beg leave to refer; observing, at the same time, that a knowledge of such as are most frequently employed, will easily be acquired from experience without any particular instructions.

OF ARABIC COMPOUNDS.

I. The manner in which different Arabic parts of speech are employed to form a variety of compounded words made use of in the Persian, is well explained by Sir William Jones in his Persian Grammar; and with respect to phrases purely Arabic, and whole sentences, which are often met with in Persian authors, they require a perfect knowledge of the Arabic language, and do not belong to this place.

OF THE CONSTRUCTION OF ARABIC INFINITIVES, PARTICIPLES, SUBSTANTIVES, AND ADJECTIVES.

I. In the Persian language, when Arabic adjectives or participles are made use of to qualify Arabic or Persian substantives singular, they agree with them in gender and number.

Ex.

1. an Arabic sub. mas. qualified by an Arabic part. pas. mas.	عاشق مذکور	the said lover
2. an Arabic sub. fem. qualified by an Arabic part. pas. fem.	والدۀ مکرمه	respected mother
3. a Pers. sub. mas. qualified by an Arabic ad. mas.	دوست قدیم	an old friend
4. a Pers. sub. fem. qualified by an Arabic ad. fem.	همشیرۀ عزیزه	dear sister

II. When Arabic adjectives and participles are made use of to qualify Arabic and Persian substantives masculine and plural, they remain in the masculine singular.

Ex.

1. an Arabic sub. mas. plu. with an Arabic part. mas. sing.	حکام مذکور	the said officers
2. a Pers. sub. mas. plu. with an Arab. part. mas. sing.	برادران مذکور	the said brethren

III. When Arabic adjectives and participles are made use of to qualify Arabic or Persian substantives feminine and plural, they are put in the feminine singular; and often, though not so properly, in the masculine singular.

Ex.

1. an Arabic sub. fem. plur. with Arabic part. sin. both fem. masc.	تکلیفات مذکوره مذکور	the said burthens
2. a Persian sub. fem. plur. with Arabic part. sing. both fem. and mas.	زنان موصوفه موصوف	accomplished women

IV. An Arabic substantive, in the Persian, is often rendered definite by a following Arabic adjective or participle having the article ال prefixed.

Ex. a sub with a part. pas.	نبي المختار	the prophet elect

For an account of the genders of Arabic words, and of their perfect and imperfect plurals, I must again refer to Mr. *Richardson's* Arabic Grammar; and to that of *Erpenius*, where the latter subject is treated at still greater length.

Of the INTRODUCTION *of the* ARABIC *into the* LANGUAGE *of* HINDOSTAN.

I. All the different species of infinitives, participles, substantives, and adjectives, which we have enumerated; and all compounds formed by *Arabic* and *Persian* words, are introduced into the language of *Hindostan*, in the same form, for the same purposes, and with the same freedom as in the *Persian:* submitting themselves to the different rules of regimen and concord that are peculiar to *that* language; in the same manner as if they were words originally belonging to it. *Arabic* adverbs, prepositions, and conjunctions, are also used in the language of *Hindostan;* but I think less frequently than in the Persian.

FRANCIS BALFOUR, M. D.

XV.

On the ASTRONOMICAL COMPUTATIONS *of the* Hindus.

By SAMUEL DAVIS *Esq.*

Bhágalpur, 15*th Feb.* 1789.

IT is, I believe, generally admitted, that inquiries into the Astronomy of the *Hindus* may lead to much curious information, besides what relates merely to the science itself; and that attempts to ascertain the Chronology of this ancient nation will, as they have hitherto done, prove unsatisfactory unless assistance be derived from such researches.

The following communication is not expected to contribute towards so desirable a purpose; but, with all its imperfections, it may have the useful effect of awakening the attention of others in this country who are better qualified for such investigations, and of inciting them to pursue the same object more successfully, by showing that numerous treatises in *Sanscrit* on Astronomy are procurable, and that the *Bráhmens* are extremely willing to explain them. As an encouragement to those who be inclined to amuse themselves in this way, I can farther venture to declare, from the experience I have had, that *Sanscrit* books in this science are more easily translated than almost any others, when once the technical terms are understood: the subject of them admitting neither of metaphysical reasoning nor of metaphor, but being delivered in plain terms and generally illustrated with examples in practice, the meaning may be well enough made out, by the help of a *Pandit*, through the medium of the *Persian* or the *Hindì* language.

Moreover, it does not appear that skill in the abstruse parts of modern mathematics is indispensably necessary; but that, with as much knowledge of geometry and the circles of the sphere as, it may be supposed, most of the members of this society possess, a considerable progress might be made in revealing many interesting particulars, which at present lie hid to *Europeans* in the *Jyótish*, or Astronomical, *Sástra*.

The prediction of eclipses and other phenomena, published in the *Hindu Patra*, or Almanac, excited my curiosity long ago to know by what means it was effected; but it was not until lately that I had any means of gratification. I had before this been inclined to think, with many others, that the *Bráhmens* possess no more knowledge in astronomy than they have derived from their ancestors in tables ready calculated to their hands, and that few traces of the principles of the science could be found among them; but by consulting some *Sanscrit* books, I was induced to alter my opinion. To satisfy myself on this subject, I began with calculating, by a modern *Hindu* formula, an eclipse which will happen in next *November;* the particulars of which process, although in some measure interesting, were not sufficient for my purpose, as it yet remained to be learnt on what grounds some tables used in it were constructed; and for this information I was referred to the *Súrya Siddhánta*, an original treatise, and reputed a divine revelation For a copy of the *Súrya Siddhánta* I am indebted to Sir ROBERT CHAMBERS, who procured it among other books at *Benares;* but the obscurity of many technical terms made it some times difficult to be understood even by the *Pandit* I employed, who was by no means deeply versed in the science he professed. By his diligence, however, and through the obliging assistance of Mr. DUNCAN at *Benares*, who procured for me the *Tícá*, or Commentary, this difficulty was at length surmounted; and a computation of the above-mentioned eclipse, not merely on the principles, but strictly by the rules, of the *Súrya Siddhánta*, is what I propose now to present you with, after such preliminary observations as may be necessary to make it intelligible.

I suppose it sufficiently well known, that the *Hindu* division of the ecliptic into signs, degrees, &c. is the same as ours; that their astronomical year is sydereal, or containing that space of time in which the sun, departing from a star, returns to the same; that it commences on the instant of his entering the sign *Aries*, or rather the *Hindu* constellation *Mésha** ; that each astronomical month contains as many even days and fractional parts as he stays in each sign ; and that the civil differs from the astronomical account of time only in rejecting those fractions, and beginning the year and month at sunrise, instead of the intermediate instant of the artificial day or night. Hence arises the unequal portion of time assigned to each month dependent on the situation of the sun's apsis, and the distance of the vernal equinoctial colure from the beginning of *Mésha* in the *Hindu* sphere ; and by these means they avoid those errors which *Europeans*, from a different method of adjusting their calendar by intercalary days, have been subject to. An explanation of these matters would lead me beyond my present intention, which is to give a general account only of the method by which the *Hindus* compute eclipses, and thereby to show, that a late *French* author was too hasty in asserting generally that they determine them " by set forms, couched in enigmatical verses, &c.†". So far are they from deserving the reproach of ignorance, which Mons. SONNERAT has implied, that on inquiry, I believe, the *Hindu* science of astronomy will be found as well known now as it ever was among them, although, perhaps, not so generally, by reason of the little encouragement men of science at present meet with, compared with what they formerly did under their native princes.

It has been common with astronomers to fix on some epoch, from which, as from a radix, to compute the planetary motions ; and the ancient *Hindus* chose that point of time counted back when, according to their motions as they had determined them, they must have been in conjunction in the beginning of *Mésha* or *Aries ;* and coeval with which circumstance they supposed the creation. This, as it concerned the planets only, would have produced a moderate term of years compared with the enormous antiquity, that will be hereafter stated ; but, having discovered a slow motion of the nodes and apsides also, and taking it into the computation, they found it would require a length of time corresponding with 1955884890 years now expired, when they were

* Or, to be more particular, on his entering the *Nacshatra*, or lunar mansion, *(Aswini)* There were formerly only twenty-seven *Nacshatras :* a 28th *(Abhijit)* has been since added, taken out of the 21st and 22d, named *Uttaráshdrá* and *Srávaná*. These three in their order comprehend 10°, 5°, and 14° 40′ of the Zodiac : the rest comprehend 13° 20′ each.

† See the translation of Mons. SONNERAT's Voyage.

so situated, and 2364115110 years more, before they would return to the same situation again, forming together the grand anomalistic period denominated a *Calpa*, and fancifully assigned as the day of BRAHMA. The *Calpa* they divided into *Manwanteras*, and greater and less *Yügas*. The use of the *Manwantera* is not stated in the *Súrya Siddhánta*; but that of the *Mahà*, or greater, *Yug* is sufficiently evident, as being an anomalistic period of the sun and moon at the end of which the latter, with her apogee and ascending node, is found, together with the sun, in the first of *Aries*; the planets also deviating from that point only as much as is their latitude and the difference between their mean and true anomaly.

These Cycles being so constructed as to contain a certain number of mean solar days, and the *Hindu* system assuming that at the creation, when the planets began their motions, a right line, drawn from the equinoctial point *Lancà* through the centre of the earth, would, if continued, have passed through the centre of the sun and planets to the first star in *Aries*: their mean longitude for any proposed time afterwards may be computed by proportion. As the revolutions a planet makes in any cycle are to the number of days composing it, so are the days given to its motion in that time; and the even revolutions being rejected, the fraction, if any, shows its mean longitude at midnight under their first meridian of *Lancà*: for places east or west of that meridian a proportional allowance is made for the difference of longitude on the earth's surface, called in *Sanscrit* the *Désántara*. The positions of the apsides and nodes are computed in the same manner; and the equation of the mean to the true place determined on principles, which will be hereafter mentioned.

The division of the *Mahà Yug* into the *Satya*, *Trétà*, *Dwápar*, and *Cali* ages does not appear from the *Súrya Siddhánta* to answer any practical astronomical purpose, but to have been formed on ideas similar to the *golden*, *silver*, *brazen*, and *iron* ages of the *Greeks*. Their origin has however been ascribed to the precession of the equinoxes by those who will of course refer the *Manwantera* and *Calpa* to the same foundation: either way the latter will be found anomalistic as has been described, if I rightly understand the following passage in the first section of the *Súrya Siddhánta*, the translation of which is, I believe, here correctly given.

——"Time, of the denomination *Murta*[*], is estimated by respirations ; six respirations make a *Vicalà*, sixty *Vicalàs* a *Danda*, sixty *Dandas* a *Nacshatra* day, and thirty *Nacshatra* days a *Nacshatra* month. The *Sávan* month is that contained between thirty successive risings of *Súrya* and varies in its length according to the *Lagna Bhuja*. Thirty *Tit'his* compose the *Chándra* month. The *Saura* month is that, in which the sun describes one sign of the Zodiac, and his passage through the twelve signs is one year, and one of those years is a *Déva* day, or day of the Gods. When it is day at *Asura*[†], it is night with the *Gods ;* and when it is day with the *Gods*, it is night at *Asura*. Sixty of the *Déva* days multiplied by six give the *Déva* year, and twelve hundred of the *Déva* years form the aggregate of the four *Yugas*. To determine the *Saura* years contained in this aggregate, write down the following numbers 4, 3, 2, which multiply by 10,000 ; the product 4,320,000 is the aggregate or *Mahà Yuga*, including the *Sandhi* and *Sandhyansa*[‡]. This is divided into four *Yugas*, by reason of the different proportions of *Virtue* prevailing on earth, in the following manner :—— Divide the aggregate 4,320,000 by 10, and multiply the quotient by four for the *Satya Yug*, by three for the *Trétà*, by two for the *Dwápar*, and by one for the *Cali Yug*. Divide either of the *Yugs* by six for its *Sandhi* and *Sandhyansa*. Seventy-one *Yugs* make a *Manwantera ;* and at the close of each *Manwantera* there is a *Sandhi* equal to the *Satya Yug*, during which there is an universal deluge. Fourteen *Manwanteras*, including the *Sandhi*, compose a *Calpa*, and at the commencement of each *Calpa* there is a *Sandhi* equal to the *Satya Yug*, or 1,728,000 *Saura* years. A *Calpa* is therefore equal to 1000 *Mahà Yugs*. One *Calpa* is a day with BRAHMÁ, and his night is of the same length ; and the period of his life is 100 of his years. One half of the term of BRAHMÁ'S life, or fifty years, is expired, and of the re-

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[*] This is mean sydereal time :—A *Nacshatra*, or sydereal, day is the time in which the earth makes a turn upon its axis, or, according to the *Hindus*, in which the stars make one complete revolution. This is shorter than the *Sávan* or solar day, which varies in its length according to the *Lagna Bhuja* or right ascension, and also from the sun's unequal motion in the ecliptic ; for both which circumstances the *Hindus* have their *equation of time*, as will appear in the calculation of the eclipse.

[†] *Asura*, the south pole, the habitation of the *Asura Loca*, or Demons, with whom the *Dévas*, who reside at *Suméru*, the north pole, wage eternal war.

[‡] *Sandhi* and *Sandhyansa*, the morning and evening twilight. The proper words, I believe, are *Sandhya* and *Sandhyansa*.

"mainder the first *Calpa* is begun; and six *Manwanteras*, including the *Sandhi*, are expired. The seventh *Manwantera*, into "which we are now advanced, is named *Vaivaswata:* of this "*Manwantera* twenty-seven *Mahà Yugs* are elapsed, and we are "now in the *Satya Yug* of the twenty-eighth, which *Satya Yug* "consists of 1,728,000 *Saura* years. The whole amount of years, "expired from the beginning of the *Calpa* * to the present "time, may hence be computed; but from the number of years "so found, must be made a deduction of one hundred times "four hundred and seventy-four divine years, or of that product "multiplied by three hundred and sixty for human years, that "being the term of BRAHMA''S employment in the creation; "after which the planetary motions commenced.

"Sixty *Vicalàs* make one *Calà*, sixty *Calàs* one *Bhága*, thirty "*Bhágas* one *Rási*, and there are twelve *Rásis* in the *Bhagana* †.

"‡ In one *Yug*, *Súrya*, *Buḍha*, and *Sucra* performed 4320000 "*Madhyama* revolutions through the Zodiac. *Mangala*, *Vrihaspati*, and *Sani* make the same number of *Síghra* revolutions

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* Construction of the *Calpa*.

		Years.
Cali,	$\frac{4320000}{10} =$	432000
Dwápar,	$\frac{4320000}{10} \times 2 =$	864000
Trétà,	$\frac{4320000}{10} \times 3 =$	1296000
Satya,	$\frac{4320000}{10} \times 4 =$	1728000
Aggregate or *Mahà Yug*,	... ...	4320000
		71
Manwantera,	... .	306720000
With a *Sandhi* equal to the *Satya Yug*,	... ...	1728000
		308448000
		14
Calpa,	... ...	4318272000
With a *Sandhi* equal to the *Satya Yug*,	... ...	1728000
Whole duration of *Calpa*,	...	4320000000

Computation of the period elapsed of the *Calpa* at the end of the last *Satya* age, when the *Súrya Siddhánta* is supposed to have been written.

		Years.
Sandhi at the beginning of the *Calpa*,	...	1728000
6 *Manwanteras*, or 308448000 × 6	=	1850688000
27 *Mahà Yugs* of the 7th *Manwantera* or 4320000 × 27	=	116640000
Satya Age of the 28th *Mahà Yug*,	... =	1728000
		1970784000

† The division of the *Bhagana*, or Zodiac, into Signs, Degrees, &c.

‡ *Súrya*, the Sun; *Budha*, Mercury; *Sucra*, Venus; *Mangala*, Mars; *Vrihaspati*, Jupiter; *Sani*, Saturn; *Chandra*, the Moon; the *Chandra Uchcha*, or *Chandróchcha*, the Moon's Apogee; *Chandra Páta*, the Moon's ascending Node. The *Madhyama* revolutions of Mars, Jupiter, and Saturn, and the *Síghra* revolutions of Venus and Mercury answer to their revolutions about the Sun.

"through it; *Chandra* makes 57753336* *Madhyama* revolutions; "*Mangala* 2296832 *Madhyama* revolutions; *Budha's Síghras* are "17937060; *Vrihaspati's Madhyamas* 364220; *Sucra's Síghras* "7022376; *Sani's Madhyamas* are 146568. The *Chandróchcha* "revolutions are 488203; the retrograde revolutions of the *Chandrapáta* are 232238.

"The time contained between sunrise and sunrise is the *Bhúmi* "*Sávan* day: the number of those days contained in a *Yug* is "1577917828†. The number of *Nacshatra* days 1582237828‡; of "*Chandra* days 1603000080; of *Adhi* months 1593336; of *Cshaya* "*Tit'his* 25082252; of *Saura* months 51840000. From either of the "planets, *Nacshatra* days deduct the number of its revolutions, the "remainder will be the number of its *Sávan* days contained in a *Yug*. "The difference between the number of the revolutions of *Súrya* and "*Chandra* gives the number of *Chándra* months; and the difference

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[*] 57753336—4320000=53433336 lunar months, or lunations in a *Yug;*

$$\text{and } \frac{1577917828}{53433336} = \overset{D.}{29},\ \overset{D.}{31}\ \overset{P.}{50},\ 6, \text{ \&c.}$$

in each mean lunation, or in English time $\overset{D.}{29}.\ \overset{H.}{12}.\ \overset{M.}{44}.\ \overset{S.}{2}\ 47'''\ 36''''$ 53433336—51840000= 1593336 *Adhi* or intercalary lunar months in 4320000 solar sydereal years.

$$\dagger\ \frac{1577917828}{4320000} = 365.\ 15.\ 31.\ 31.\ 24.$$ diurnal revolutions of the Sun, the lenth of the *Hindu* year.

$$\ddagger\ \frac{1582237828}{4320000} = 365.\ 15.\ 31.\ 31.\ 24.$$ diurnal revolutions of the stars in one year.

$$\frac{1577917828}{57753336} = 27.\ 19.\ 18.\ 1.\ 37.$$ &c. the Moon's periodical month. The 1603000080 *Chándra*, or lunar days, called also *Tit'his*, are each one-thirtieth part of the moon's synodical month or relative period, and vary in length according to the inequality of her motion from the sun. The *Cshaya Tit'his* and *Adhi*, or intercalary lunar months, are sufficiently evident.

The sun and planets preside alternately over the days of the week, which are named accordingly. The first day after the creation was *Ravivar*, or *Sunday*: it began at midnight, under the meridian of *Lancà*; and the *Ravivar* of the *Hindus* corresponds with our Sunday. The sun and planets in the same manner govern the years: hence they may be said to have *weeks* of years. *Daniel's* prophecy is supposed to mean *weeks* of years.

The *Hindu* cycle of 60, supposed by some to be the Chaldean *Sosos*, is referred to the planet Jupiter: "one of these years is equal to the time in which by the mean motion, he "(*Vrihaspati*) advances one degree in his orbit" (Commentary on the *Súrya Siddhánta*.) This cycle is, I believe, wholly applied to astrology. Neither this cycle of 60 nor the *Pitri's* day are mentioned in this part of the *Súrya Siddhánta*, where they might be expected to occur. Perhaps on inquiry there may be found some reason for supposing them both of a later invention. "The *Pitris* inhabit behind *Chandra*, and their mid-day happens when "*Chandra* is in conjunction with *Súrya*; and their midnight, when *Chandra* is in opposition "to *Súrya*; their morning, or sunrise, is at the end of half the *Crishna Pacsha*; and their "sunset at the end of half the *Sucla Pacsha*; this is declared in the *Sacelya Sanhita*. Their "names are *Agni*, *Swati*, &c. their day and night are therefore together equal to one *Chándra* month." (Commentary).—Hence, it appears, the *Hindus* have observed that the moon revolves once on her axis in a lunar month, and consequently has the same side always opposed to the earth. They have also noticed the difference of her apparent magnitude in the horizon and on the meridian, and endeavoured to explain the cause of a phenomenon, which *Europeans* as well as themselves are at a loss to account for.

"between the *Saura* months and *Chándra* months gives their number "of *Adhi* months. Deduct the *Sávan* days from the *Chándra* days, "the remainder will be the number of *Tit'hi Cshayas.* The number "of *Adhi* months, *Tit'hi Cshayas*, *Nacshatra*, *Chándra*, and *Sávan* "days, multiplied severally by 1000, gives the number of each "contained in a *Calpa.*

"The number of *Mandóchcha* revolutions, which revolutions "are direct, or according to the order of the signs contained in a "*Calpa*, is of *Súrya* 387; of *Mangala* 204; of *Budha* 368; of "*Vrihaspati* 900; of *Sucra* 535; of *Sani* 39.

"The number of revolutions of the *Pátas*, which revolutions "are retrograde, or contrary to the order of the signs contained in "a *Calpa*, is of *Mangala* 214; of *Budha* 488; of *Vrishaspati* 174; "of *Sucra* 903; of *Sani* 662. The *Páta* and *Uchcha* of *Chandra* are "already mentioned."

It must be observed, that, although the planetary motions as above determined might have served for computations in the time of *Meya*, the author of the *Súrya Siddhánta*, yet for many years past they have not been found to agree with the observed places in the heavens in every instance; and that corrections have accordingly been introduced, by increasing or reducing those numbers. Thus the motions of the moon's apogee and node are now increased in computations of their places by the addition of four revolutions each in a *Yug* to their respective numbers above given. The nature of these corrections, denominated in *Sanscrit Bíja*, is explained in a passage of the *Tícà*, or Commentary, on the *Súrya Siddhánta*, wherein is maintained the priority of that *Sástra* in point of time to all others. The translation of that passage, together with the text it illustrates, is as follows:

(Súrya Siddhánta). "*Arca* (the Sun) addressing *Meya*, who "attended with reverence, said, let your attention, abstracted from "human concerns, be wholly applied to what I shall relate. *Súrya* "in every former *Yug* revealed to the *Munis* the invariable science "of astronomy. The planetary motions may alter; but the "principles of that science are always the same."

The Commentary.—"Hence it appears, that the *Súrya Siddhánta* "was prior to the *Brahma Siddhánta* and every other *Sástra;* "because this *Sástra* must be the same that was revealed *in every* "*former Yug*, although the motions of the planets might have "been different. This variation in the planetary motions is "mentioned in the *Vishnu Dhermotter*, which directs that the "planets be observed with an instrument, whereby their agree-"ment or disagreement may be determined in regard to their "computed places; and in case of the latter, an allowance of *Bija* "accordingly made. *Vasisht'ha* in his *Siddhánta* also recommends "this occasional correction of *Bija*, saying to the *Muni Mandavya*, "'I have shown you how to determine some matters in astronomy; "but the mean motion of *Súrya* and the other planets will be found "to differ in each *Yug*.' Accordingly *Aryabhatta*, *Brahmagupta*, "and others, having observed the heavens, formed rules on the "principles of former *Sástras*, but which differed from each other "in proportion to the disagreements which they severally observed "of the planets, with respect to their computed places.

"Why the *Munis*, who certainly knew, did not give the parti-"culars of those deviations, may seem unaccountable, when the "men *Aryabhatta*, *Brahmagupta*, and others have determined them. "The reason was, that those deviations are not in themselves uni-"form; and to state their variations would have been endless. It "was therefore thought better, that examinations at different times "should be made, and due corrections of the *Bija* introduced. A "*Ganita Sástra*, whose rules are demonstrable, is true; and when "conjunctions, oppositions, and other planetary phenomena, calcu-"lated by such *Sástras*, are found not to agree with observation, a "proportionable *Bija* may be introduced without any derogation "from their credit. It was therefore necessary, that this *Sástra* "(the *Surya Siddhánta*) should be revealed in each *Yug*, and that "other *Sástra* should be composed by the *Munis*.

"The original *Sástra* then appears to be the *Surya Siddhánta*; "the second, the *Brahma Siddhánta*; the third, the *Paulastya* "*Siddhánta*; the fourth, the *Sóma Siddhánta*."

In the following table are given the periodical revolutions of the planets, their nodes and apsides, according to the *Surya Siddhánta*. The corrections of *Bija* at present used, are contained in one column*, and the inclination of their orbits to the ecliptic in another. The obliquity of the ecliptic is inserted according to the same *Sástra.* Its diminution does not appear to have been noticed in any subsequent treatise. In the tables of *Macaranda* and also in the *Grahalághava*, the latter written only 268 years ago, it is expressly stated at twenty-four degrees.

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* This I must, however, at present omit, not having as yet discovered the corrections of this kind that will bring even the Sun's place, computed by the *Súrya Siddhánta*, exactly to an agreement with the astronomical books in present use. Of these books, the principal

The motion of the equinoxes, termed in *Sanscrit* the *Cránti*, and spoken of in the *Tícà*, or commentary, on the *Súrya Siddhánta* as the Sun's *Páta* or node, is not noticed in the foregoing passage of that book; and, as the *Hindu* astronomers seem to entertain an idea of the subject different from that of its revolution through the *Platonic* year, I shall farther on give a translation of what is mentioned, both in the original and commentary, concerning it.

The next requisite for the computation of the eclipse is the portion of the *Calpa* expired to the present time, which is determined in the following manner:

The *Súrya Siddhánta* is supposed to have been received, through divine revelation, towards the close of the *Satya* age, at the end of which, 50 of the years of *Brahmá* were expired, and of the next *Calpa*, or day, 6 *Manwanteras*, 27 greater *Yugs*, and the *Satya* age of the 28th *Yug*, together with the *Sandhyà* or twilight at the beginning of the *Calpa;* the aggregate of which several periods is 1970784000 years elapsed of the *Calpa* to the beginning of the last *Trétà* age; to which add the *Trétà* and *Dwápar* ages, together with the years elapsed of the present *Cali* age, for the whole amount of sydereal years from the beginning of the *Calpa* to the present *Bengal* year. But in the foregoing quotation it is observed, from that amount of years must be made a deduction of 47400 divine, or 17064000 human or sydereal years, the term of *Brahmá's* employment in the work of creation; for, as the universe was not completed, the planetary motions did not commence until that portion of the *Calpa* was elapsed.

This deduction appears to have been intended as a correction, which, without altering the date of the *Calpa* as settled, probably, by yet more ancient astronomers, might (joined perhaps with other regulations) bring the computed places of the planets to an agreement with their observed places, when the *Súrya Siddhánta* was

are the *Grahalághava*, composed about 268 years ago, the tables of *Macaranda* used at *Benares* and *Tirhut*, and the *Siddhánta Rahasya*, used at *Nadiya;* the last written in 1513 *Sacal*, or 198 years ago.

The *TABLE*. See page 183.

The Planets in their order.	*Sydereal Period.*	*Period of the Apsides.*	*Period of the Nodes.*	*Mean motion per day* ′ ″ *per danda*″ ‴	*Inclination of the Orbit.*	Cacshà *or circumference of the Orbit.*
	Days. D. P. V.	Days. D.	Days. D.	″ ‴		*Yójan.*
The Moon,	27 19 18 1 &c.	3232 50 ——	6794 23	790 35	4 30	324000
Mercury,	87 58 10 ——	4287820184 46 ——	3233742458 11	186 24	2 —	1043208
Venus,	281 39 38 ——	2949379117 45 &c.	1747417306 45	37	2 —	26646637
The Sun,	365 15 31 31 24	4077307049 5 ——	Precession of the equinoxes 54″ per year.	59 8	Obliquity of the Ecliptic 24°.	4331500
Mars,	686 59 50 58	7735087392 9 &c.	7373447794 23 &c.	31 26	1 30	8146909
Jupiter,	4332 19 14 20 &c.	1753242031 6 &c.	9068493264 22 &c.	5 —	1 —	51375764
Saturn,	10765 46 2 18	42767123794 52 &c.	2383561073 42 &c.	2 —	2 —	127668255

The longitude of the Sun's apogee in the *Hindu* sphere is 2ˢ, 17°, 17′, 15″, to which add the *Ayanánsa* 19°, 21′, 27″, the sum 3ˢ, 6°, 38′, 42″ is its place according to *European* expression. In this the *Hindu* account differs about 1° 22′ from the observations of *European* astronomers, who determine the place of the earth's aphelion in the present age to be in 9ˢ, 8°, 1′. There is a much greater disagreement with respect to the aphelia and nodes of the other planets.

On supposition that the obliquity of the ecliptic was accurately observed by the ancient *Hindus* as 24°, and hat its decrease has been from that time half a second a year, the date of the *Súrya Siddhánta* will be about 3840 years. It is remarkable that the *Hindus* do not appear to have noticed its decrease.

The *Cacshàs* are explained farther on.

written; and, as the arguments of its commentator in support of the propriety of it, without prejudice to other authors, contain some curious particulars, I hope I may be excused for departing from my immediate object to insert a translation of them.

"In the *Súrya Siddhánta*, *Sóma Siddhánta*, *Prajápati*, "*Vasist'ha*, and other *Sástras*, this deduction is required to be made "from the *Calpa*, because at the end of that term the planetary "motions commenced. The son of *Jishnu*, who understood four "*Védas*, and *Bháscaráchárya*, considered these motions as commencing with the *Calpa*. It may seem strange that there should "be such a disagreement. Some men say, As it is written that the "*Calpa* is the day of *Brahmá*, and as a day is dependent on the "rising and setting of the sun, the motion of the sun and planets "must have begun with the *Calpa*; and therefore *Bráhmagupta* "should be followed; but I think otherwise. The *Calpa* or "*Brahmá's* day is not to be understood as analogous to the solar "day otherwise than as containing a determined portion of time; "neither is it at all dependent on the commencement of the "*Calpa*; but, being composed of the same periods as the latter, it "will not end until the term of years here deducted shall be expired "of the next *Calpa*. The motions of the *Grahas* must therefore "be computed from the point of time here stated, as the beginning "of *Brahmá's* day, and not as *Brahmagupta* and others direct, from "the beginning of the *Calpa*; which will not be found to answer.

"Other men say, that rules derived from the *Ganita Sástra* "and agreeing with observation, are right; that any period de-"duced from such a mode of computation, and the planets deter-"mined to have been then in the first of *Mésha*, may be assumed; "that it will therefore answer either way, to consider these motions "as beginning with the *Calpa*, or after the above-mentioned period "of it was expired. This however is not true; for in the instance "of *Mangala* there will be found a great difference, as is here "shown. The revolutions of *Mangala* in a *Calpa*, according to "*Brahmagupta*, are 2296828522, and, by the rule of proportion, the "revolutions of *Mangala* in 17064000 years are 9072472 7^s 28° 0′ "16″*. For any other planet, on trial, a similar disagreement will

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* Because $\frac{2296828522 \times 17064000}{\div 320000000}$ Revolutions $= 9072472\ 7^s\ 28^\circ\ 0'\ 16''$.

" be found, and the proposition of computing from either period " must be erroneous. Moreover, of what use is it to make computations for a space of time, when the planets and their motions " were not in being ?

" It might, however, from the foregoing circumstances, be imputed to *Brahmagupta* and the rest, that they have given precepts " through ignorance, or with intent to deceive—That, having stated " the revolutions of the planets different from the account revealed " by *Súrya*, they must certainly have been in error—That *Brahmagupta* could not have counted the revolutions from the beginning " of the *Calpa;* neither could he from the mean motion of the " planets have so determined them.—He was a mortal, and therefore could not count the revolutions.—Although the rule of " proportion should be granted to have served his purpose for the " revolutions of the planets, yet it certainly could not for those of " their *Mandóchcha*, because it was not within the term of a man's " life to determine the mean motion of the *Mandóchcha;* and this " assertion is justified by the opinion of *Bháscaráchárya*. But the " rule of proportion could not have answered even for the planets; " for, although their mean motion be observed one day, and again " the next, how can a man be certain of the exact time elapsed " between the two observations? And if there be the smallest " error in the elapsed time, the rule of proportion cannot answer " for such great periods. An error of the 10-millionth part of a " second *(Vicalà)* in one day, amounts to forty degrees* in the " computation of a *Calpa;* and the mistake of 1-tenth of a respiration in one *Saura* year, makes a difference in the same period " of 20000 days. That it is therefore evident, *Brahmagupta's* " motive for directing the planetary motions to be computed as " commencing with the *Calpa*, was to deceive mankind, and that " he had not the authority of the *Munis*, because he differs from " the *Súrya Siddhánta*, *Brahma Siddhánta*, *Sóma Siddhánta;* " from *Vasist'ha*, and other *Munis*.

" Such opinions would have no foundation, as I shall proceed " to show. *Brahmagupta's* rules are consistent with the practice " of the *Pandits* his predecessors; and he formed them from the " *Purana Vishnu Dhermottara*, wherein is contained the *Brahma*

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* The error would be more than 43°.

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"*Siddhánta;* and the periods given by *Aryabhatta* are derived
"from the *Parásera Siddhánta:* the precepts of the *Munis* are
"therefore the authorites of *Brahmagupta*, *Aryabhatta*, and *Bhá-*
"*caráchárya* whose rules cannot be deceitful. The *Munis* them-
"selves differed with regard to the number of *Sávan* days in a
"*Yug*, which is known from the *Pancha Siddhánta*, composed by
"*Vara Achárya;* wherein are proposed two methods of computing
"the sun's place, the one according to the *Súrya Siddhánta*, the
'other according to the *Rómacá Siddhánta;* whence it appears
'that there were different rules of computation even among the
"*Munis*. It is also mentioned in the *Tícà* on the *Varáha Sanhitá*,
"that, according to the *Paulastya Siddhánta*, there was formerly a
"different number of *Sávan* days estimated in a *Yug*. The
"maxims therefore of *Brahmagupta* and the other two, agreeing
"with those of the *Munis*, are right; but, should it even be sup-
"posed that the *Munis* themselves could be mistaken, yet *Brahma-*
"*gupta* and the other two had the sanction of the *Védas*, which
"in their numerous *Sác'hás* (branches) have disagreements of the
"same kind; and, according to the *Sácalya Sanhitá*, *Brahmá*, in
"the revelation he made to *Náred*, told him, although a circum-
"stance or thing were not perceptible to the senses, or reconcileable
"to reason, if authority for believing it should be found in the
"*Védas*, it must be received as true.

"If a planet's place, computed both by the *Súrya Siddhánta*
"and *Parásera Siddhánta*, should be found to differ, which rule
"must be received as right? I answer, that which agrees with his
"place by observation: and the *Munis* gave the same direction.
"If computations from the beginning of the *Calpa*, and from the
"period stated in the *Súrya Siddhánta* give a difference, as appears
"in the instance of *Mangala*, which of the two periods to be
"computed from is founded in truth? I say, it is of no consequence
"to us which, since our object is only to know which period
"answers for computation of the planetary places in our time, not
"at the beginning of the *Calpa*. The difference found in com-
"puting according to *Brahmagupta* and the *Munis*, must be corrected
"by an allowance of *bíja*, or by taking that difference as the
"*cshépa;* but the books of the *Munis* must not be altered, and the
"rules given by *Brahmagupta*, *Varáchárya*, and *Aryabhatta* may

"be used with such precautions. Any person may compose "a set of rules for the common purposes of astronomy; but, "with regard to the duties necessary in eclipses, the computation "must be made by the books of the *Munis*, and the *bíja* applied; "and in this manner it was that *Varáha*, *Aryabhatta*, *Brahma-* "*gupta*, and *Césava Samvatsara*, having observed the planets and "made due allowance of *bíja*, composed their books.

"*Ganésa* mentions, that the *Grahas* were right in their com- "puted places in the time of *Brahmá*, *Achárya*, *Vasist'ha*, "*Casyapa*, and others, by the rules they gave, but in length of time "they differed; after which, at the close of the *Satya* age, *Súrya* "revealed to *Meya* a computation of their true places. The rules "then received answered during the *Trétà* and *Dwáper* ages, as "also did other rules formed by the *Munis* during those periods. "In the beginning of the *Cali Yug*, *Parásera's* book answered; but "*Aryabhatta*, many years after, having examined the heavens, "found some deviation, and introduced a correction of *bíja*. After "him, when further deviations were observed, *Durgá Sinha*, "*Mihira*, and others, made corrections. After them came the son "of *Jistnu* and *Brahmagupta*, and made corrections. After them "*Césava* settled the places of the planets; and, sixty years after "*Césava*, his son *Ganésa* made corrections."

We have now, according to the *Hindu* system, the mean motion of the planets, their nodes and apsides, and the elapsed time since they were in conjunction in the first of *Mésha*, with which, by the rule of proportion, to determine their mean longitude for any proposed time of the present year. It is, however, observed in the *Súrya Siddhánta*, that to assume a period so great is unnecessary; for use, the computation may be made from the beginning of the *Trétà* age, at which instant all the *Grahas*, or moveable points in the heavens, were again in conjunction in *Mésha*, except the apogees and ascending nodes, which must therefore be computed from the creation. The same is true of the beginning of the present *Cali* age; for the greatest common divisor of the number of days composing the *Mahà Yug* and the planetary revolutions in that period, is four, which quotes 394479457 days, or 1080000 years; and the *Trétà* and *Dwápar* ages contain together twice that number of years. The present *Hindu* astronomers therefore find it unneces-

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sary to go farther back than the beginning of the *Cali Yug** in determining the mean longitude of the planets themselves; but for the position of their apsides and nodes, the elapsed time since the creation must be used; or at least in instances, as of the sun, when the numbers 387 and 432,0000000 are incommensurable but by unity. I have however in the accompanying computation, taken the latter period in both cases.

For the equation of the mean to the true anomaly, in which the solution of triangles is concerned, and which is next to be considered, the *Hindus* make use of a canon of sines, constructed according to the *Súrya Siddhánta*, in the following manner:—"Divide the number of minutes contained in one sine 1800 by "eight, the quotient 225′ is the first *Jyápinda*, or the first of the "twenty-fourth portions of half the string of the bow. Divide the first "*Jyápinda* by 225′, the quotient 1′ deduct from the dividend, and "the remainder 224′ add to the first for the second *Jyápinda* 449′. "Divide the second *Jyápinda* by 225′, the quotient being 1 and the "fraction more than half a minute, deduct 2′ from the foregoing "remainder 224′, and add the remainder so found to the second for the "third *Jyápinda* 671′. Divide this by 225′, the quotient 3′ deduct "from the last remainder 222′; the remainder so found 219′, add to "the third for the fourth *Jyápinda* 890′. Divide this by 225′, and the "quotient deduct from the last remainder; the remainder so found "add to the fourth for the fifth *Jyápinda* 1105, and proceed in this "manner until the twenty-four *Cramajyás*† are completed, which "will be as follows: $\overset{1}{225}$, $\overset{2}{449}$, $\overset{3}{671}$, $\overset{4}{890}$, $\overset{5}{1105}$, $\overset{6}{1315}$, $\overset{7}{1520}$, $\overset{8}{1719}$, "$\overset{9}{1910}$, $\overset{10}{2093}$, $\overset{11}{2267}$, $\overset{12}{2431}$, $\overset{13}{2585}$, $\overset{14}{2728}$, $\overset{15}{2859}$, $\overset{16}{2978}$, $\overset{17}{3084}$, $\overset{18}{3177}$, $\overset{19}{3256}$, "$\overset{20}{3321}$, $\overset{21}{3372}$, $\overset{22}{3409}$, $\overset{23}{3431}$, $\overset{24}{3438}$. For the *utcramajyá*‡, the twenty-"third *cramajyá* deducted from the *trijyá* or twenty-fourth

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* Neither do they, in computing by the formulas in common use, go farther back than to some assigned date of the æra *Saca;* but, having the planets' places determined for that point of time, they compute their mean places and other requisites for any proposed date afterwards by tables, or by combinations of figures contrived to facilitate the work: as in *Grahalághava*, *Siddhánta-Rahasya*, and many other books. An inquirer into *Hindu* astronomy having access to such books only, might easily be led to assert that the *Bráhmans* compute eclipses *by set forms, couched in enigmatical verses*, out of which it would be difficult to develop their system of astronomy; and this I apprehend was the case with Mons. *Sonnerat*. The *Jyótish Pandits* in general, it is true, know little more of astronomy than they learn from such books, and they are consequently very ignorant of the principles of the science; but there are some to be met with who are better informed.

† *Cramajyás*, right sines.

‡ *Utcramajyás*, versed sines.

cramajyà, leaves the first *utcramajyà;* the twenty-second deducted from the twenty-third, leaves the second *utcramajyà;* the twenty-first from the twenty-second, leaves the third; the twentieth from the twenty-first, leaves the fourth. In the same manner proceed until the *utcramajyàs* are completed; which will be as follows: $\overset{1}{7}$, $\overset{2}{29}$, $\overset{3}{66}$, $\overset{4}{117}$, $\overset{5}{182}$, $\overset{6}{261}$, $\overset{7}{354}$, $\overset{8}{460}$, $\overset{9}{579}$, $\overset{10}{710}$, $\overset{11}{853}$, $\overset{12}{1007}$, $\overset{13}{1171}$, $\overset{14}{1345}$, $\overset{15}{1528}$, $\overset{16}{1719}$, $\overset{17}{1928}$, $\overset{18}{2123}$, $\overset{19}{2233}$, $\overset{20}{2548}$, $\overset{21}{2767}$, $\overset{22}{2989}$, $\overset{23}{3213}$, $\overset{24}{3438}$." So far the *Sûrya Siddhànta* on the subject of the sines. The commentator shows how they are geometrically constructed: "With a radius describe a circle, the periphery of which divide into 21600 equal parts, or minutes. Draw north and south, and east and west, lines through the centre: set off contrariwise from the east point, 225 on the periphery, and draw a string from those extremities across the *trijyà*.* The string is the *jyà*, and its half the *ardhajyà*, called *jivà*. The *Pandits* say, a planet's place will correspond with the *ardhajyà;* by which, therefore, computations of their places are always made; and by the term *jyà* is always understood the *ardhajyà*. The first *jyà* will be found to contain 449 minutes, and the operation, repeated to twenty-four divisions, will complete the *cramajyà*. In each operation, the distance contained between the *jyà* and its arc, or that line which represents the arrow of a bow, must be examined, and the number of minutes therein contained taken for the *utcramajyà*. The circle may represent any space of land; the *bhujajyà*† is the *bhuja;* the *cótijyà*‡ the *cóti*, and the *trijyà* the *carna*. The square of the *bhujajyà* deducted from the square of the *trijyà*, leaves the square of the *cótijyà;* the root of which is the *cótijyà;* and, in the same manner, from the *cótijyà* is determined the *bhujajyà*. The *cótyutcramajyà* deducted from the *trijyà*, leaves the *bhujacramajyà*. The *bhujótcramajyà*, deducted from the *trijyà*, leaves the *cóticramajyà*. When the *bhujajyà* is the first division of the *trijyà*, the *cótijyà* is the twenty-three remaining divisions; which *cótijyà* deducted from the *trijyà*, leaves the *bhujótcramajayà*. On this principle are the

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* *Trijyà*, the Radius.
† *Bhujajyà*, the Sine.
‡ *Cótijyà*, the Sine complement.

"*jyà's* given in the text :* they may be determined by calculation "also, as follows :

"The *trijyà* take as equal to 3438 minutes, and containing "twenty-four *jyàpindas;* its half is the *jyà* of one sine or 1719′; "which is the eighth *jyàpinda*, or the sixteenth *cótijyàpinda*. The "square of the *trijyà* multiply by 3, and divide the product by 4, "the square root of the quotient is the *jyà* of two sines, or 2977′. "The square root of half the square of the *trijya* is the *jyà* of one "sine and an half (45°) or 2431′; which deducted from the *trijyà* "leaves the *uṭcramajayà* 1007′. By this *utcramajayà* multiply the "*trijayà*; the square root of half the product is the *jyà* of 22°, 30′, "or 1315′. The square of this deduct from the square of the "*trijyà*, the square root of the difference is the *jyà*, of 67°, 30′, or "3177′, which is the *cótijyà* of 22° 30′ equal to 1315′. The *bhujajyà* and *cótijyà* deducted severally from the *trijyà*, leaves the "*utcramajyà* of each 2123′, and 261′."—&c.

This is sufficient to show, that the *Hindus* have the right construction of the sines, although they do not appear, from any thing I can learn, ever to have carried it farther than to twenty-four divisions of the quadrant, as in the following table. Instances of the like inaccuracy will occur in the course of this paper. The table of sines may perhaps be more clearly represented in the following manner :

Right Sines, the Radius containing 3438 *Minutes.*

Arc.	Sine.	Arc.	Sine.	Arc.	Sine.
1st = 225 = 3°,45′	225	9th = 2025 = 33°,45	1910	17th = 3825 = 63°,45	3084
2d = 450 = 7 ,30	449	10th = 2250 = 37 ,30	2093	18th = 4050 = 67 ,30	3177
3d = 675 = 11 ,15	671	11th = 2475 = 41 ,15	2267	90th = 4275 = 71 ,15	3256
4th = 900 = 15 ,—	890	12th = 2700 = 45 ,—	2431	20th = 4500 = 75 ,—	3321
5th = 1125 = 18 ,45	1105	13th = 2925 = 48 ,45	2585	21st = 4725 = 78 ,45	3376
6th = 1350 = 22 ,30	1315	14th = 3150 = 52 ,30	2728	22d = 4950 = 82 ,30	3409
7th = 1575 = 26 ,15	1520	15th = 3275 = 56 ,15	2859	23d = 5175 = 86 ,15	3431
8th = 1800 = 30 ,—	1719	16th = 3600 = 60 ,—	2978	24th = 5400 = 90 ,—	3438

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* A diagram might here be added for illustration, but it must be unnecessary to any one who has the smallest knowledge of Geometry.

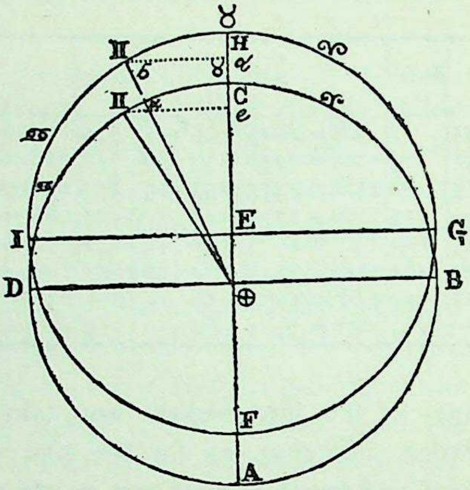
Versed Sines.

Arc.	Sine.	Arc.	Sine.	Arc.	Sine.
1st = 225′ = 3°,45	7	9th = 2025 = 33°,45	579	17th = 3825 = 63°.45	1928′
2d = 450 = 7 ,30	29	10th = 2250 = 37 ,30	710	18th = 4050 = 67 ,30	2123
3d = 675 = 11 ,15	66	11th = 2475 = 41 ,15	853	19th = 4275 = 71 ,15	2233
4th = 900 = 15 ,—	117	12th = 2700 = 45 ,—	1007	20th = 4500 = 75 ,—	2548
5th = 1125 = 18 ,45	182	13th = 2925 = 48 ,45	1171	21st = 4725 = 78 ,45	2767
6th = 1350 = 22 ,30	261	14th = 3150 = 52 ,30	1345	22d = 4950 = 82 ,30	2989
7th = 1575 = 26 ,15	354	15th = 3275 = 56 ,15	1528	23d = 5175 = 86 ,15	3213
8th = 1800 = 30 ,—	460	16th = 3600 = 60 ,—	1719	24th = 5400 = 90 ,—	3438

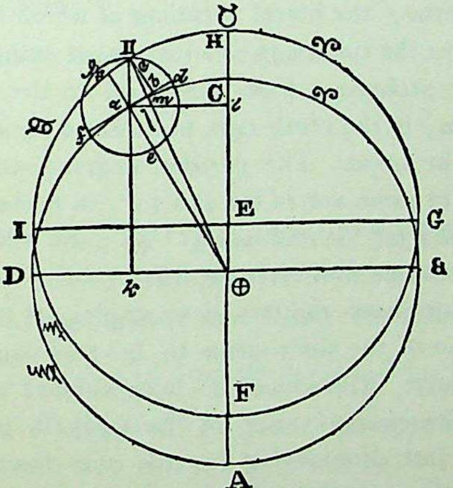
For the sines of the intermediate arcs, take a mean proportion of the tabular difference, as for the sine of 14°, which is between the third and fourth tabular arcs, or 165 minutes exceeding the third; therefore 225′ being the difference of those arcs, and 219 the difference of their sines, $\frac{165' \times 219'}{225'} = 160', 36''$, or a mean proportional number, to be added to the sine of the third tabular arc, for the sine required of 14° or 831′ 36″. In the sexagesimal arithmetic, which appears to be universally used in the *Hindu* astronomy, when the fraction exceeds half unity, it is usually taken as a whole number: thus, 831′, 35″. 35‴, would be written 831′ 36.

To account for the apparent unequal motion of the plantes, which they suppose to move in their respective orbits through equal distances in equal times, the *Hindus* have recourse to excentric circles, and determine the excentricity of the orbits of the sun and moon with respect to that circle, in which they place the earth as the centre of the universe, to be equal to the sines of their greatest anomalistic equations; and accordingly that the delineation of the path of either may be made in the following manner:

Describe a circle, which divide as the ecliptic into signs, degrees, and minutes; note the place of the *Mandóchcha*, or higher apsis, which suppose in ♉. Draw a diameter to that point, and set off, from the centre ⊕ towards the place of the apogee, the excentricity equal to the sine of the greatest equation, which of the sun is 130′ 32″. Here the excentricity is represented much greater, that the figure may be better understood. Round the point E, as the centre, describe the excentric circle FGHI, which is the sun's orbit,



and in the point H, where it is cut by the line $\oplus$ ♉ prolonged, is the place of the *Mandóchcha*, or higher apsis, and in the opposite point F is the lower. From the place of the apogee H, set off its longitude in reverse, or contrary to the order of the signs, for the beginning of *Aries*, and divide this circle, as the former, into signs and degrees. Note the sun's mean longitude in each circle, as suppose in *Gemini*, and from both points draw right lines to the earth at $\oplus$: according to the *Hindu* system, which appears to be the same as the *Ptolemaic*, the angle $a \oplus C$, will be the mean anomaly, the angle $b \oplus C$ the true anomaly, and the angle $a \oplus b$ their difference, or the equation of the mean to the true place; to be subtracted in the first six signs of anomaly, and added in the last six. The *Europeans*, in the old astronomy found the angle $b \oplus C$, by the following proportion, and which subtracted from $a \oplus C$ left the equation, which as the *Hindus*, they inserted in tables calculated for the several degrees of the quadrant;—as the co-sine of the mean anomaly $\oplus e = Ed$ added to the excentricity $E \oplus$, is to the sine of the mean anomaly $ae = bd$; so is the radius to the tangent of the true anomaly: or, in the right angled triangle $d \oplus b$, in which are given $d \oplus$ and bd, if $d \oplus$ be made radius, bd will be the tangent of the angle $b \oplus d$, required. The *Hindus*, who have not the invention of *tangents*, take a different method, on principles equally true. They imagine the small circle or epicycle, *cdef*, drawn round the planet's mean place *a* with a radius equal to the excentricity, which in this case, of the sun, is 130′ 30″, and whose circumference in degrees, or equal divisions of the deferent ABCD, will be in proportion as their semi-diameters; or, as $\oplus C = 3438'$, to $ABCD = 360°$, so $ag = 130' \ 32''$, to $efgd = 13° \ 40'$, which is called the *paridhi-ansa*, or *paridhi* degrees. In the same proportion also will be the correspondent sines hc and ai, and their co-sines cb and lk, which are therefore known by computation, in minutes or equal parts of the radius $a\oplus$, which contains, as before mentioned 3438′. In the right angled triangle $h\oplus c$, right angled at h, there are given the sides $h\oplus$, $(= a\oplus + cb$, because $cb = ha)$, and hc; to find the hypotenuse $c\oplus$, by means of which the angle $a\oplus m$ may be determined; for its sine is lm, and, in the similar triangles $hc\oplus$ and $lm\oplus$, as $c\oplus$ is to $m\oplus$, so is hc to lm, the sine of the angle of equation. From the third to the ninth sine of anomally, the co-sine cb must be subtracted from the radius 3438′ for the side $h\oplus$.



It is, however, only in computing the retrogradations and other particulars respecting the planets *Mercury*, *Venus*, *Mars*, *Jupiter*, and *Saturn*, where circles greatly excentric are to be considered, that the *Hindus* find the length of the *carna* or hypotenuse $c\oplus$; in other cases, as for the anomalistic equations of the sun and moon, they are satisfied to take hc as equal to the sine lm, their difference, as the commentator on the *Súrya Siddhánta* observes, being inconsiderable.

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Upon this hypothesis are the *Hindu* tables of anomaly computed with the aid of an adjustment, which, as far as I know, may be peculiar to themselves. Finding that, in the first degree of anomaly both from the higher and lower apsis, the difference between the mean and observed places of the planets was greater than became thus accounted for, they enlarged the epicycle in the apogee and perigee, proportionably to that observed difference for each planet respectively, conceiving it to diminish in inverse proportion to the sine of the mean anomaly, until at the distance of three sines, or half-way between those points, the radius of the epicycle should be equal to the excentricity or sine of the gratest equation. This assumed difference in the magnitude of the epicycle, they called the difference of the *paridhi ansa*, between *vishama* and *sama ;* the literal meaning of which is *odd* and *even.* From the first to the third sign of anomaly, or rather in the third, a planet is in *vishama ;* from the third to the sixth, or in the perigee, in *sama ;* in the ninth sign, in *vishama ;* and in the twelfth, or the apogee, in *sama.* The *paridhi* degrees, or circumference of the epicycle in *sama* are, of the sun 14° ; in *vishama* 13° 40′ ; of the moon in *sama* 32° ; in *vishama* 31° 40′ ; the difference assigned to each between *sama* and *vishama*, 20′.

To illustrate these matters by examples, let it be required to find the equation of the sun's mean to his true place in the first degree of anomaly. The sine of 1° is considered as equal to its arc, or 60.—The circumference of the eqicycle in *sama*, or the *apogee*, is 14°, but diminishing in this case towards *vishama*, in inverse proportion to the sine of anomaly.—Therefore, as radius 3438 is to the difference between *sama* and *vishama* 20′, so is the sine of anomaly 60′ to the diminution of the epicycle in the point of anomaly proposed, 20″$\left(=\frac{60' \times 20'}{3438}\right)$ which, subtracted from 14°, leaves 13° 59′ 40″. Then, as the circumference of the great circle 360° is to the circumference of the epicycle 138 59′ 40″, so is the sine of anomaly 60′ to its correspondent sine in the epicycle *h c ;* which, as was observed, is considered as equal to *l m*, or true sine of the angle of equation 2′ 19″ 56‴ $\left(=\frac{13^\circ\ 59'\ 40'' + 60'}{360^\circ}\right)$, which, in the *Hindu* canon of sines, is the same as its arc, and is therefore the equation of the mean to the true place in 1° of anomaly, to be added in the first six sines and subtracted in the last six.

For the equation of the mean to the true place in $5° 14'$ of anomaly. The sine of $5° 14'$ is $313' 36'' 8'''$ and $\frac{313' 36'' 8''' + 20' = 6272' 2'' 40'''}{3438'} =$ $1' 49''$, to be deducted from the *paridhi* degrees in *sama.*—$14° 1' 49'' = 13° 58' 11''$, and $\frac{313', 36'', 8''' + 13°, 58', 11'' = 4379', 59'', 37}{360°} = 12' 9'' 59'''$ the sine of the angle of equation, which is equal to its arc.

For the same in $14°$ of anomaly. The sine of $14°$, is 831 36.—$\frac{831' 36'' \times 20'}{3438'} = 4' 50''$, and, $\frac{14° - 4' 50'' \times 831' 38''}{360°} = 32' 9''$ the sine of the angle of equation.

For the same in two sines of anomaly. The sine of $60°$ is $2978'$ $\frac{2978' \times 20'}{3438'} = 17', 19''$; and $\frac{14° - 17', 19'' \times 2978'}{360°}$ $113' 25'' 20'''$, the sine of equation, equal to its arc.

For the equation of the mean to the true place of the moon in 1° of anomaly. The *paridhi* degrees of the moon in *sama* are $32°$, in *vishama* $31°, 40'$, the difference $20'$. The sine of $1°$ is $60'$ and $\frac{60' \times 20''}{3438'} = 21''$, to be deducted from the *paridhi* degree in *sama*, $32° - 21'' = 31° 59' 39''$. $\frac{31°, 59', 39'' + 60'}{360°} = 5', 20''$, the equation, required.

For the same in ten degrees of anomaly. The sine of $10°$ is $597'$ $\frac{597' \times 20'}{3438'} = 3' 28''$, and $\frac{32° - 3', 28'' \times 597'}{360°} = 52' 58''$, the equation required.

For the same in three sines of anomaly. The sine of $90°$ is the radius or $3438'$, and $\frac{3438' \times 20'}{3438'} = 20'$, $\frac{32° - 20' \times 3438'}{360°} = 302', 25''$, the sine of the greatest angle of equation, equal to the radius of the epicycle in this point of anomaly, the arc corresponding with which is $302' 45''$, the equation required.

For the equation of the mean to the true motion in these

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several points of anomaly, say, as radius 3438, is to the mean motion, so is the co-sine *c b* of the anomalistic angle *g a c* in the epicycle, to the difference between the mean and apparent motion, or the equation required, to be subtracted from the mean motion in the first three sines of anomaly ; added in the next six ; and subtracted in the last three.

Example, for the sun, in 5° 14′ of anomaly. The co-sine of 5° 14′ in the *Hindu* canon is 3422′ 17″ 52‴. The *paridhi* circle in this point found before, is 13° 58′ 11″ ; and $\frac{3422,\ 17',\ 52''' + 13°,\ 58',\ 11''}{360°} =$ 132′ 48″ the co-sine *c b* in the epicycle ; then, as radius 3438′ is to the sun's mean motion 59′ 8″ per day, or 59″ 8‴ per *danda ;* so is the co-sine *c b* = 132′ 48″, to the equation required, 2′ 17″ per day, or 2″ 17‴ per *danda*. The motion of the sun's apsis is so slow as to be neglected in these calculations ; but that of the moon is considered, in order to know her mean motion from her apogee, which is 783′ 54″.

In this manner may be determined the equation of the mean to the true anomaly and motion for each degree of the quadrant ; and which will be found to agree with the tables of *Macaranda.* The following tables are translated from that book :

Solar Equations, *Ravi p'hala.*

Anomaly.	*Eq. of the mean to the true place.*	*Eq. of the mean to the true motion.*	*Anomaly.*	*Eq. of the mean to the true place.*	*Eq. of the mean to the true motion.*	*Anomaly.*	*Eq. of the mean to the true place.*	*Eq. of the mean to the true motion.*
°	° ′ ″	′ ″	°	° ′ ″	′ ″	°	° ′ ″	′ ″
1	2 20	2 18	31	1 8 —	1 55	61	1 54 30	1 4
2	4 40	2 18	32	1 9 57	1 53	62	1 55 34	1
3	7 —	2 18	33	1 11 57	1 53	63	1 56 35	58
4	9 19	2 17	34	1 13 47	1 51	64	1 57 34	57
5	11 37	2 17	35	1 15 40	1 51	65	1 68 34	55
6	13 56	2 17	36	1 17 32	1 49	66	1 59 30	55
7	16 15	2 16	37	1 19 23	1 47	67	2 — 23	52
8	18 33	2 16	38	1 21 11	1 45	68	2 1 14	49
9	20 51	2 15	39	1 22 57	1 43	69	2 2 4	46
10	23 7	2 14	40	1 24 42	1 42	70	2 2 51	43
11	25 23	2 14	41	1 26 26	1 40	71	2 3 35	41
12	27 39	2 13	42	1 28 7	1 38	72	2 4 17	39
13	29 55	2 13	43	1 29 46	1 36	73	2 4 57	37
14	32 10	2 12	44	1 31 23	1 34	74	2 5 35	35
15	34 24	2 11	45	1 32 58	1 32	75	2 6 12	32
16	36 37	2 11	46	1 34 32	1 30	76	2 6 45	31
17	38 39	2 10	47	1 36 4	1 29	77	2 7 17	28
18	41 1	2 9	48	1 37 35	1 28	78	2 7 45	25
19	43 12	2 8	49	1 39 6	1 28	79	2 8 12	23
20	45 22	2 7	50	1 40 36	1 26	80	2 8 35	22
21	47 31	2 6	51	1 42 3	1 23	81	2 8 58	20
22	49 39	2 6	52	1 43 26	1 19	82	2 9 18	18
23	51 47	2 5	53	1 44 45	1 16	83	2 9 36	15
24	53 53	2 3	54	1 46 2	1 14	84	2 9 51	12
25	55 57	2 2	55	1 47 17	1 13	85	2 10 3	10
26	58 1	2 1	56	1 48 33	1 13	86	2 10 13	8
27	1 — 2	2 —	57	1 49 47	1 12	87	2 10 20	6
28	1 2 53	1 58	58	1 51 —	1 11	88	2 10 27	4
29	1 4 3	1 57	59	1 52 12	1 11	89	2 10 31	1
30	1 6 2	1 56	60	1 53 25	1 8	90	2 10 32	

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Lunar Equations, *Chándra p'hala.*

Anomaly.	*Eq. of the mean to the true place.*	*Eq. of the mean to the true motion.*	*Anomaly.*	*Eq. of the mean to the true place.*	*Eq. of the mean to the true motion.*	*Anomaly.*	*Eq. of the mean to the true place.*	*Eq. of the mean to the true motion.*
°	° ′ ″	′ ″	°	° ′ ″	′ ″	°	° ′ ″	′ ″
1	5 20	69 39	31	2 36 37	59 20	61	4 25 26	33 41
2	10 40	69 38	32	2 41 11	58 41	62	4 27 36	32 39
3	16 —	69 33	33	2 45 36	58 —	63	4 29 59	31 35
4	21 19	69 28	34	2 49 58	57 19	64	4 32 19	30 29
5	26 36	69 21	35	2 54 20	56 37	65	4 34 37	29 22
6	31 54	69 13	36	2 58 39	55 56	66	4 36 47	28 13
7	37 12	69 4	37	3 2 54	55 14	67	4 38 54	27 7
8	42 29	68 54	38	3 7 5	54 30	68	4 40 54	26 1
9	47 44	68 43	39	3 11 12	53 44	69	4 42 50	24 55
10	52 58	68 28	40	3 15 16	52 58	70	4 44 40	23 49
11	58 11	68 11	41	3 19 18	51 26	71	4 46 24	22 42
12	1 3 23	67 52	42	3 23 24	50 57	72	4 48 5	21 34
13	1 8 40	67 35	43	3 27 26	50 48	73	4 49 38	20 24
14	1 13 45	67 17	44	3 30 54	49 46	74	4 51 9	19 14
15	1 18 53	66 55	45	3 34 39	48 54	75	4 52 53	18 3
16	1 24 —	66 38	46	3 38 21	48 —	76	4 53 54	16 51
17	1 29 5	66 18	47	3 41 58	47 5	77	4 55 6	15 38
18	1 34 9	65 57	48	3 45 32	46 9	78	4 56 15	14 25
19	1 39 10	65 36	49	3 48 59	45 13	79	4 57 17	13 14
20	1 44 9	65 14	50	3 52 24	44 19	80	4 58 13	12 3
21	1 49 17	64 50	51	3 55 46	43 27	81	4 59 6	10 53
22	1 54 3	64 24	52	3 59 2	42 32	82	4 59 53	9 41
23	1 58 3	63 56	53	4 2 13	41 37	83	5 — 27	8 34
24	2 3 47	63 24	54	4 5 18	40 41	84	5 1 8	7 14
25	2 8 35	62 53	55	4 8 18	39 44	85	5 1 40	6 2
26	2 13 22	62 22	56	4 11 16	38 47	86	5 2 3	4 51
27	2 18 6	61 48	57	4 14 11	37 50	87	5 2 20	3 40
28	2 22 47	61 13	58	4 17 —	36 51	88	5 2 36	2 37
29	2 27 35	60 35	59	4 19 46	35 48	89	5 2 44	1 44
30	2 32 2	59 56	60	4 22 29	34 48	90	5 2 48	— —

Having the true longitude of the sun and moon, and the place of the node determined by the methods explained, it is easy to judge, from the position of the latter, whether at the next conjunction or opposition there will be a solar or a lunar eclipse ; in which case the *tit'hi*, or date of the moon's synodical month, must be computed from thence, to determine the time counted from midnight of her full or change. Her distance in longitude from the sun, divided by 720′, the minutes contained in a *tit'hi*, or the thirtieth part of 360°, the quotient shows the *tit'hi* she has passed, and the fraction, if any, the part performed of the next ; which, if it be the fifteenth, the difference between that fraction and 720′ is the distance she has to go to her opposition, which will be in time proportioned to her actual motion ; and that time being determined, her longitude, the longitude of the sun, and place of the node may be known for the instant of full moon, or middle of the lunar eclipse. The *Hindu* method of computing these particulars is so obvious in the accompanying instance, as to require no further description here ; and the same may be said with respect to the declination of the sun and the latitude of the moon.

It is evident from what has been explained, that the *Pandits*, learned in the *Jyo'tish Sástra*, have truer notions of the form of the earth and the economy of the universe than are ascribed to the *Hindus* in general : and that they must reject the ridiculous belief of the common *Bráhmens*, that eclipses are occasioned by the intervention of the monster *Ráhu*, with many other particulars equally unscientific and absurd. But, as this belief is founded on explicit and positive declarations contained in the *Védas* and *Purânas*, the divine authority of which writings no devout *Hindu* can dispute, the astronomers have some of them cautiously explained such passages in those writings as disagree with the principles of their own science ; and, where reconciliation was impossible, have apologized, as well as they could, for propositions necessarily established in the practice of it, by observing, that sertain things, as stated in other *Sástras*, "might have been so formerly, "and may be so still ; but for astronomical purposes, astronomical "rules must be followed." Others have, with a bolder spirit, attacked and refuted unphilosophical opinions. *Bhâscara* argues, that it is more reasonable to suppose the earth to be self-balanced in

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infinite space, than that it should be supported by a series of animals, with nothing assignable for the last of them to rest upon; and *Nerasinha*, in his commentary, shows that by *Ráhu* and *Cétu*, the head and tail of the monster, in the sense they generally bear, could only be meant the position of the moon's nodes and the quantity of her latitude, on which eclipses do certainly depend; but he does not therefore deny the reality of *Ráhu* and *Cétu*: on the contrary, he says, that their actual existence and presence in eclipses ought to be believed, and may be maintained as an article of faith, without any prejudice to astronomy. The following *Slo'ca*, to which a literal translation is annexed, was evidently written by a *Jyo'tish*, and is well known to the *Pandits* in general:

Vip'haláñyanyas'ástráni, vivádastéshu cévalam:
Sap'halam jyótisham s'ástram, chandrárcau yatra s'ácshinau.

"Fruitless *are all* other *Sástras;* in them *is* contention only: Fruitful *is* the *Jyótish Sástra*, where the sun *and* moon *are* two witnesses."

The argument of *Varáha achárya* concerning the monster *Ráhu*, might here be annexed, but, as this paper will without it be sufficiently prolix, I shall next proceed to show how the astronomical *Pandits* determine the moon's distance and diameter, and other requisites for the prediction of a lunar eclipse.

The earth they consider as spherical, and imagine its diameter divided into 1600 equal parts, or *Yójanas*. An ancient method of finding a circle's circumference was to multiply the diameter by three; but this being not quite enough, the *Munis* directed that it should be multiplied by the square root of ten. This gives for the equatorial circumference of the earth in round numbers 5059 *Yójanas*, as it is determined in the *Súrya Siddhánta*. In the table of sines, however, found in the same book, the radius being made to consist of 3438 equal parts or minutes, of which equal parts the quadrant contains 5400, implies the knowledge of a much more accurate ratio of the diameter to the circumference; for by the first it is as 1. to 3. 1627, &c. by the last, as 1. to 3. 14136; and it is determined by the most approved labours of the *Europeans*, as 1. to 3. 14159, &c. In the *Puránas* the circumference of the earth is declared to be 500,000,000 *Yójans;* and, to account for this amazing difference the commentator before quoted thought, "the "*Yójan* stated in the *Súrya Siddhánta* contained each 100,000 of "those meant in the *Puránas;* or perhaps, as some suppose, the "earth was really of that size in some former *Calpa*. Moreover, "others say, that from the equator southward, the earth increases "in bulk: however, for astronomical purposes, the dimensions "given by *Súrya* must be assumed." The equatorial circumference being assigned, the circumference of a circle of longitude in any latitude is determined. As radius 3438 is to the *Lambajyà* or sine of the polar distance, equal to the complement of the latitude to ninety degrees, so is the equatorial dimension 5059, to the dimension in *Yójans* required.

Of a variety of methods for finding the latitude of a place, one is by an observation of the *palabhà*, or shadow, projected from a perpendicular *Gnomon* when the sun is in the equator. The *Sancu*, or *Gnomon*, is twelve *angulas*, or digits, in length divided, each into sixty *vingulas;* and the shadow observed at *Benares* is $\overset{A}{5},\ \overset{V}{45}.$ Then, by the proportion of a right angled triangle $\sqrt{12.^2 + 5{,}45.} = \overset{A}{13}\ \overset{V}{18}$ the *acsha-carna* (hypotenuse) or distance from the top of the *Gnomon* to the extremity of the shadow; which take as radius, and the projected shadow will be the sine of the zenith distance, in this case equal to the latitude of the place $\frac{3438' + \overset{A}{5}\cdot\overset{V}{45}}{\overset{A}{13}\ \overset{V}{18}} = 1487'$, the arc corresponding with which, in the canon of sines, is 25° 26′ the latitude of *Benares*. The sine complement of the latitude is 3101′ 57″, and again by trigonometry $\frac{3101'' 57'' + \overset{Y}{5059}\ 38}{3438} =$ 4565, 4 *Yójans* the circumference of a circle of longitude in the latitude of *Benares*.

The longitude is directed to be found by observation of lunar eclipses calculated for the first meridian, which the *Súrya Siddhánta* describes as passing over *Lancá, Róhítaca, Avanti,* and *Sannihita-saras*. *Avanti* is said by the commentator to be "now called *Ujjayiní*," or *Ougein*, a place well known to the *English* in the *Mahratta* dominions. The distance of *Benares* from this meridian is said to be sixty-four *Yójan* eastward, and as 4565 *Yójan*, a circle of longitude at *Benares*, is to sixty *dandas* the natural day, so is sixty-four *Yójan*, to $\overset{\textit{Danda}}{0}$, $\overset{\textit{Pala}}{50}$, the difference of longitude in time, which marks the time after midnight, when, strictly speaking, the astronomical day begins at *Benares**. A total lunar eclipse was observed to happen at *Benares* fifty-one *palas* later than a calculation gave it for *Lancá*, and $\frac{51 + 4565\ 4}{60} =$ sixty-four *Yójana*, the difference of longitude on the earth's surface.

According to *Rennel's* Map, in which may be found *Ougein*, and agreeably to the longitude assigned to *Benares*, the equinoctial point *Lancá* falls in the eastern ocean southward from *Ceylon* and the *Maldiva* islands. *Lancá* is fabulously represented as one of four cities built by *Dévatás* at equal distances from each other, and also from *Suméru* and *Bádawánal*, the north and south poles, whose walls are of gold, &c. and with respect to *Meya's* performing his famous devotions, in reward of which he received the astronomical revelations from the sun recorded in the *Súrya Siddhánta*, the commentator observes, "he performed those devotions in *Sálmala* "a country a little to the eastward of *Lancá*: the dimensions of "*Lancá* are equal to one twelfth part of the equatorial circumfer- "ence of the earth," &c. Hence perhaps on inquiry may be found whether by *Sálmala* is not meant *Ceylon*. In the history of the war of *Ráma* with *Ráwan* the tyrant of *Lancá*, the latter is said to have married the daughter of an *Asura* named *Meya*: but these disquisitions are foreign to my purpose.

For the dimensions of the moon's *cacsha* (orbit) the rule in the *Sanscrit* text is more particular, than is necessary to be explained to any person, who has informed himself of the methods used by *European* astronomers to determine the moon's horizontal parallax. In general terms, it is, to observe the moon's altitude, and thence with other requisites to compute the time of her ascension from the sensible *cshitija*, or horizon, and her distance from the sun when upon the rational horizon, by which to find the time of her passage from the one point to the other; or, in other words,

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* "This day *(astronomical day)* is accounted to begin at midnight under the *réc'há* "(meridian) of *Lancá*; and at all places east or west of that meridian, as much sooner or "later as is their *désántera* (longitude) reduced to time, according to the *Súrya Siddhánta*, "*Brahma Siddhánta*, *Vasishtha Siddháanta*, *Sóma Siddhánta*, *Parásera Siddhánta*, and "*Aryabhatta*. According to *Brahmagupta* and others, it begins at sunrise; according to "the *Rómacà* and others it begins at noon; and according to the *A'rsha Siddhánta* at sunset." *(Tícà* on the *Súrya Siddhánta)*.

'to find the difference in time between the meridian, to which the 'eye referred her at rising, and the meridian she was actually upon ;' in which difference of time she will have passed through a space equal to the earth's semidiameter or 800 *Yójan :* and by proportion, as that time is to her periodical month, so is 800 *Yójan* to be circumference of her *cacshà* 324000 *Yójan.* The errors arising from refraction, and their taking the moon's motion as along the sine instead of its arc, may here be remarked ; but it does not seem that they had any idea of the first*, and the latter they perhaps thought too inconsiderable to be noticed. Hence it appears, that they made the horizontal parallax 53′ 20″ and her distance from the earth's centre 51570 *Yójan ;* for $\frac{180^\circ \times 1600}{324000} = 53' \, 20''$; and as 90° or 5400′ is to the radius 3438′, so is one-fourth of her orbit 81000 *Yójan* to 51570, and $\frac{51570 \times 21600}{5059} = 220184$, the same distance in geographical miles. *European* astronomers compute the mean distance of the moon about 240000, which is something above a fifteenth part more than the *Hindus* found it so long ago as the time of *Meya*, the author of the *Súrya Siddhánta.*

By the *Hindu* system the planets are supposed to move in their respective orbits at the same rate ; the dimensions therefore of the moon's orbit being known, those of the other planets are determined, according to their periodical revolutions, by proportion. As the sun's revolutions in a *Mahà Yug* 4320000 are to the moon's revolutions in the same cycle 57753336, so is her orbit 324000 *Yo′jan* to the sun's orbit 4331500 *Yo′jan ;* and in the same manner for the *cacshà's* or orbits of the other planets. All true distance and magnitude derivable from parallax, is here out of the question ; but the *Hindu* hypothesis will be found to answer their purpose in determining the duration of eclipses, &c.

For the diameters of the sun and moon, it is, directed to observe the time between the appearance of the limb upon the horizon and the instant of the whole disk being risen, when their apparent motion is at a mean rate, or when in three signs of anomaly ; then, by proportion, as that time is to a natural day, so are their orbits to their diameters respectively, which of the sun is 6500 *Yo'jan*; of the moon, 480 *Yo'jan*. These dimensions are increased or diminished, as they approach the lower or higher apsis, in proportion as their apparent motion exceeds or falls short of the mean, for the purpose of computing the diameter of the earth's shadow at the moon, on principles which may perhaps be made more intelligible by a figure.

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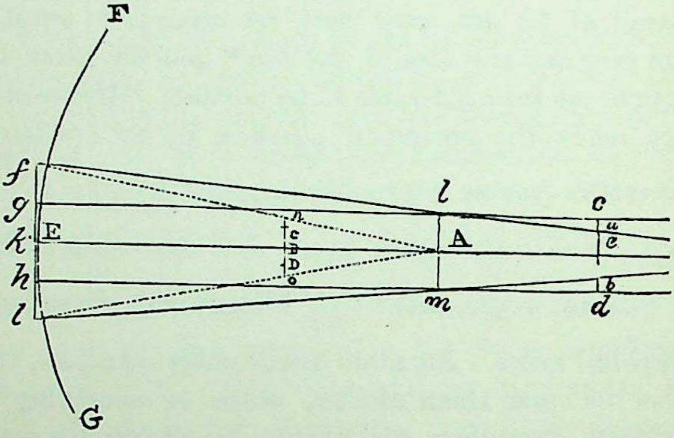
* But they are not wholly ignorant of optics : they know the angles of *incidence* and *reflection* to be equal, and compute the place of a star or planet, as it would be seen reflected from water or a mirror.



Let the earth's diameter be *lm* = *gh* = *cd*; the distance of the moon from the earth AB, and her diameter CD. By this system, which supposes all the planets moving at the same rate, the dimensions of the sun's orbit will exceed the moon's, in proportion as his period in time exceed hers; let his distance be AE, and EFG part of his orbit. According to the foregoing computation also, the sun's apparent diameter *f i*, at this distance from the earth, is 6500 *Yo'jan*; or rather, the angle his diameter subtends when viewed in three signs of anomaly, would be 6500 parts of the circumference of a circle consisting of 4331500, and described round the earth as a center with a radius equal to his mean distance, which is properly all that is meant by the *vishcambha*, and which, therefore, is increased or diminished according to his equated motion. This in three signs of anomaly is equivalent to 32′ 24″; for, as 4331500 to 360°, so 6500 to 32′ 24″. The *Europeans* determine the same to be 32′ 22″. In the same manner, the sun's *vishcambha* in the mean *cacshà* of the moon, or the portion of her orbit in *Yo'jans*, included in this angle, is found, as 4331500 is to 324000, so is 6500 to 486 *Yo'jan* or *n*, *o*, of use in solar eclipses; but this I am endeavouring to explain is a lunar one. It is evident, that the diameter of the earth's shadow at the moon will be $c,\,d$,—$c,\,a+b,\,d$, or $a\,b$ when her distance is $A\,e$; and that $c\,a$ and $b\,d$ will be found by the following proportion : as $A\,k$ is to $f\,i - g\,h = f\,g + h\,i$, so is $A\,e$ to $c\,a + b\,d$. But it has been observed that $A\,k$ and $f\,i$ are proportioned by the *Hindus* according to the moon's distance $A\,e$, the apparent motion of the sun and moon and the angles subtended by their diameters. The *Hindu* rule therefore states, As the sun's *vishcambha* or diameter is to the moon's, so is the difference of the diameters of the sun and earth, in *Yo'jans*, to a fourth number, equal to $c\,a + b\,d$ to be subtracted from the *súchì*, or $l\,m = c\,d$ to find $a\,b$; also, that the number of *Yo'jans*, thus determined as the diameters of the moon and shadow, may be reduced to minutes of a great circle by a divisor of fifteen. For, as the minutes contained in 360° = 21600, are to the moon's orbit in *Yo'jan* 324000, so is one minute to fifteen *Yo'jan*.

The diameter of the moon's disk, of the earth's shadow, and the place of the node being found, for the instant of opposition or full moon, the remaining part of the operation differs in no respect that I know of from the method of *European* astronomers to compute a lunar eclipse. The translation of the Formula for this purpose, in the *Súrya Siddhánta*, is as follows : "The earth's "shadow is always six signs distant from *Súrya*, and *Chandra* is "eclipsed whenever at the *púrnimà* the *páta* is found there ; as is "also *Súrya*, whenever at the end of the *amávasyà* the *páta* is "found in the place of *Súrya* ; or, in either case, when the *páta* "is nearly so situated. At the end of the *amávasyà tit'hi* the signs, "degrees, and minutes of *Su'rya* and *Chandra* are equal ; and at the "end of the *pu'rnimà tit'hi* the difference is exactly six signs ; take "therefore the time unexpired of either of those *tit'his*, and the "motion for that time add to the *madhyama*, and the degrees and "minutes of *Súrya* and *Chandra* will be equal. For the same "instants of time compute the place of the *páta* in its retrograde "motion, and, if it should be in conjunction with *Su'rya* and "*Chandra*, then, as from the intervention of a cloud, there will be "an obscurity of *Súrya* or of *Chandra*. *Chandra*, from the west, "approaches the earth's shadow, which on entering, he is "obscured. For the instant of the *pu'rnimà*, from the half sum of

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"the *chandramána* and the *tamóliptamána* subtract the *vicshépa*, "the remainder is the *ch'channa.* If the *ch'channa* is greater* "than the *grahyamána*, the eclipse will be total; and if less, "the eclipse will be proportionably less. The *grahya* and "*gráhaca* deduct and also add; square the differance and the "sum severally; subtract the square of the *vicshépa* from each of "those squares, and the square root of each remainder multiply "by sixty; divide each product by the difference of the *gati* of "*Su'rya* and *Chandra;* the first quotient will be half the duration "of the eclipse in *dandas* and *palas;* and the second quotient "will be half the *vimardárdha* duration in *dandas* and *palas*," &c. The *ch'channa*, or portion of the disk eclipsed, is here found in degrees and minutes of a great circle: it may also be estimated in *digits;* but the *angulas* or digits of the *Hindus* are of various dimensions in different books.

The beginning, middle, and end of the eclipse may now be supposed found for the time in *Hindu* hours, when it will happen after midnight; but, for the corresponding hour of the civil day, which begins at sunrise, it is further necessary to compute the length of the artificial day and night; and, for this purpose, must be known the *ayanánsa* or distance of the vernal equinox from the first of *mésha*, the sun's right ascension and declination; which several requisites shall be mentioned in their order.

Respecting the precession of the equinoxes and place of the colure, the following is a translation of all I can find on the subject in the *Súrya Siddhánta* and its commentary:—

Text. "The *ayanánsa* moves eastward thirty times twenty in "each *Mahà Yug;* by that number (600) multiply the *ahargana* "(number of mean solar days for which the calculation is made) "and divide the product by the *sávan* days in a *Yug*, and of the "quotient take the *bhuja*, which multiply by three, and divide the "product by ten; the quotient is the *ayanánsa*. With the *ayanánsa* "correct the *graha*, *cránti*, the *ch'háya'* *charadala*, and other requi-"sites to find the *pushti* and the two *vishuvas*. When the *carna* is "less than the *su'rya ch'háya'*, the *prácchacra* moves eastward, and "the *ayanánsa* must be added; and when more, it moves westward, "and the *ayanánsa* must be subtracted.

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* Or, when the *ch'channa* and *grahyamána* are equal, the eclipse is *total*.

Commentary. “ By the text, the *ayana bhagana* is understood
“ to consist of 600 *bhaganas* (periods) in a *Maha' Yug;* but some
“ persons say, the meaning is thirty *bhaganas* only, and according-
“ ly that there are 30000 *bhaganas.* Also that *Bháscar Achárya*
“ observes, that, agreeably to what has been delivered by *Sú'rya,*
“ there are 30000 *bhaganas* of the *ayanánsa* in a *Calpa.* This is
“ erroneous ; for it disagrees with the *Sástras* of the *Rĭshis.* The
“ *Sácalya Sanhità* states that the *bhaganas* of the *Cránti páta* in a
“ *Maha' Yug* are 600 eastward. The same is observed in the
“ *Vasist'ha Siddhánta,* and the rule for determining the *ayanánsa*
“ is as follows :—The expired years divide by 600, of the quotient
“ make the *bhuja,* which multiply by three, and divide the product
“ by ten. The meaning of *Bháscar Achárya* was not, that *Sú'rya* gave
“ 30000 as the *bhaganas* of the *ayanánsa* in a *Cálpa,* the name he
“ used being *Saura* not *Sú'rya,* and applied to some other book. From
“ the *natánsa* is known the *crántyansa,* and from the *crántijyà* the
“ *bhujajyà,* the arc of which is the *bhujánsa* of *Súrya,* including the
“ *ayanánsa ;* this for the first three months ; after which, for the
“ next three months, the place of *Súrya,* found by this mode of
“ calculation, must be deducted from six signs. For the next three
“ months the place of *Súrya* must be added to six signs, and for the
“ last three months the place of *Sú'rya* must be deducted from twelve
“ signs. Thus, from the shadow may be computed the true place of
“ *Sú'rya.* For the same instant of time compute his place by the
“ *ahargana,* from which will appear whether the *ayanánsa* is to be
“ added or subtracted. If the place found by the *ahargana* be less
“ than the place found by the shadow, the *ayanánsa* must be added.
“ In the present time the *ayanánsa* is added. According to the
“ author of the *Varasanhità,* it was said to have been formerly
“ deducted* ; and the southern *ayana* of *Sú'rya* to have been in
“ the first half of the *nacshatra Asléshà*† ; and the northern *ayana*

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* ‘It was said to have been formerly *rina.*” In the *Hindu* specious arithmetic, or al-
gebra, *dhana* signifies affirmation or addition, and *rina* negation or subtraction : the sign of
the latter is a point placed over the figure, or the quantity noted down ; thus, 4 added to 7,
is equal to 3. See the *bija ganita,* where the mode of computation is explained thus : When
a man has four pieces of money, and owes seven of the same value, his circumstances re-
duced to the form of an equation, or his books balanced, show a deficiency of three pieces.

† This describes the place of the solstitial colure ; and, according to this account of
the *ayanánsa,* the equinoctial colure must then have passed through the tenth degree of the
nacshatra Bharaní and the 3° 20 of *Visác'há.* The circumstance, as it is mentioned in the
Vara Sanhità, is curious and deserving of notice. I shall only observe here, that, although
it does not disagree with the present system of the *Hindus* in regard to the motion of the
equinoctial points, yet the commentator on the *Varasanhità* supposes that it must have been
owing to some preternatural cause. The place here described of the colure is on comparison

"in the beginning of *Dhanishtà :* that in his time the southern *ayana* was in the beginning of *Carcata*, or Cancer; and the northern in the beginning of *Macara*, or Capricorn.

"The *bhaganas* of the *ayanánsa* in a *Maha' Yug* are 600, the *saura* years in the same period 4,320,000; one *bhagana* of the *ayanánsa* therefore contains 7,200 years. Of a *bhagana* there are four *pádas*. *First páda :*—When there was no *ayanánsa ;* but the *ayanánsa* beginning from that time and increasing, it was added. It continued increasing 1800 years; when it became at its utmost, or twenty-seven degrees. *Second páda :*—After this it diminished; but the amount was still added, until, at the end of 1800 years more, it was diminished to nothing. *Third páda :*—The *ayanánsa* for the next 1800 years was deducted; and the amount deducted at the end of that term was twenty-seven degrees. *Fourth páda :*—The amount deduction diminished; and at the end of the next term of 1800 years, there was nothing either added or subtracted. The *Munis*, having observed these circumstances, gave rules accordingly: if in the *sávan* days of a *Maha' Yug* there are 600 *bhaganas*, what will be found in the *ahargana* proposed? which statement will produce *bhaganas*, sines, &c.; reject the *bhaganas*, and take the *bhuja* of the remainder, which multiply by three and divide by ten, because there are four *pádas* in the *bhagana ;* for if in 90° there is a certain number found as the *bhuja*, when the *bhuja* degrees are twenty-seven, what will be found? and the numbers twenty-seven and ninety used in the computation being in the ratio of three to ten, the latter are used to save trouble.

"There is another method of computating the *ayanánsa :* The *cránti-páta-gati* is taken at one minute per year; and according to this rule the *ayanánsa* increases to twenty-four degrees; the time necessary for which, as *one páda* is 1440 years. This is the *gati* of the *nacshatras* of the *cránti mandala*.

"The *nacshatras Révatì* rises where the *nári mandala* and the *cshitija* intersect*; but it has been observed to vary twenty-seven

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of the *Hindu* and *European* spheres about 3° 40′ eastward of the position, which it is supposed by Sir *Isaac Newton*, on the authority of *Eudoxus*, to have had in the *primitive* sphere at the time of the Argonautic expedition.

* This can happen only when there is no *ayandnsa*. The *nári mandala* is the equator. The *yóga* star of *Révati* is in the last of *Mína* (Pisces) or, which is the same, in the *first* of *Mésha* (Aries) and has no latitude in the *Hindu* tables. Hence, from the *ayandnsa* and time of the beginning of the *Hindu* year, may be known their zodiacal stars. *Révati* -is the

"degrees north and south. The same variation is observed in the "other *nacshatras*: it is therefore rightly said, that the *chacra* "moves eastward. The *chacra* means all the *nacshatras.* The "planets are always found in the *nacshatras*, and the *cránti-páta-* "*gati* is owing to them, not to the planets; and hence it is ob- "served in the text, that the *páta* draws *chandra* to a distance "equal to the *cránti* degrees."

Here, to my apprehension, instead of a revolution of the equinoxes through all the signs in the course of the *Platonic* year, which would carry the first of *Vaisác'h* through all the seasons, is clearly implied a libration of those points from the third degree of *Pisces* to the twenty-seventh of *Aries*, and from the third of *Virgo* to the twenty-seventh of *Libra*, and back again in 7200 years; but, as this must seem to *Europeans* an extraordinary circumstance to be stated in so ancient a treatise as the *Súrya Siddhánta*, and believed by *Hindu* astronomers ever since, I hope the above quotations may attract the attention of those who are qualified for a critical examination of them, and be compared with whatever is to be found in other *Sástras*, on the same subject. Whatever may be the result of such an investigation, there is no mistaking the rule for determining the *ayanánsa*, which was at the beginning of the present year 19° 21′, and consequently the vernal equinox in *Pisces* 10° 39′ of the *Hindu* sphere; or, in other words, the sun entered *Mésha* or *Aries*, and the *Hindu* year began when he was advanced 19° 21′ into the northern signs, according to *European* expression.

The *ayanánsa* added to the sun's longitude in the *Hindu* sphere, gives his distance from the vernal equinox: of the sum take the *bhuja*, that is, if it exceeds three sines, subtract it from six sines; if it exceeds six sines, subtract six from it; and if it exceeds nine sines, subtract it from twelve. The quantity so found will be the sun's distance from the nearest equinoctial point from which is found his declination—as radius is to the *paramápacramajyà*, or sine of the greatest declination 24°, so is the sun's distance from the nearest

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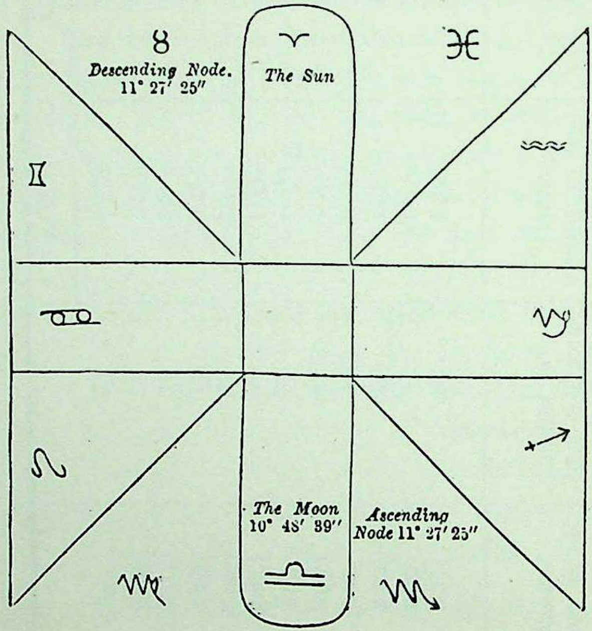
name of the twenty-seventh *lunar* mansion, which comprehends the last 13° 20′ of *Mína.* When the *ayanánsa* was 0, as at the creation, the beginning of the *Cali Yug.* &c. the colure passed through the *yóga* star of *Révati.* It is plain, that in this passage *Révati* applies either to the particular *yóga* star of that name or to the last, or twenty-seventh *lunar* mansion, in which it is situated. (See a former note.) In each *nacshatra*, or planetary mansion, there is *one* star called the *yóga*, whose latitude, longitude, and right ascension the *Hindus* have determined and inserted in their astronomical tables.

equinoctial point to the declination sought ; which will agree with the table of declination in present use, to be found in the tables of *Macaranda*, and calculated for the several degrees of the quadrant. The declination thus determined for one sign, two signs and three signs, is 11° 43′, 20° 38′, and the greatest declination or the angle of inclination of the ecliptic and equator 24°. The co-sines of the same in the *Hindu* canon are 3366′, 3217′ and 3141′ ; and, as the co-sine of the declination for one sine, is to the co-sine of the greatest declination, so is the sine of 30° to the sine of the right ascension for a point of the ecliptic at that distance from either of the two *viskuvas*, or equinoctial points. In this manner is found the right ascension for the twelve signs of the ecliptic reckoned from the vernal equinox ; and also, by the same management of triangles, the ascensional difference and oblique ascension for any latitude : which several particulars are inserted in the *Hindu* books, as in the following table, which is calculated for *Bhágalpur* on supposition that the *palabhà* or equinoctial shadow is $\overset{A}{5}\ \overset{V}{30}$. By the *Lagna* of *Lancà*, *Madhyama*, or mean *Lagna*, the *Hindus* mean those points of the equator which rise respectively with each thirtieth degree of the ecliptic counted from *Aries* in a right sphere, answering to the right ascension in any latitude ; by the *Lagna* of a particular place, the oblique ascension, or the divisions of the equator which rise in succession with each sign in an oblique sphere, and by the *chara* the ascensional difference.

Signs.	Lagna of Lancà.		Chara of Bhágalpur.		Ullagna.	
Hindu *Names.*	*In respirations answering to minutes of the equator.*	*In* palas, *or minutes of time,* 3600 *to a* Nacshatra *day.*	*In respirations answering to minutes of the equator.*	*In* palas, *or minutes of time,* 3600 *to a* Nacshatra *day.*	*In respirations answering to minutes of the equator.*	*In* palas, *or minutes of time,* 3600 *to a* Nacshatra *day.*
Mésha,	1670	278	327	55	1343	224
Vrísha,	1795	299	268	45	1527	255
Mit'huna,	1935	323	110	18	1825	304
Carcata,	1935	323	110	18	2045	341
Sinha,	1795	299	268	45	2063	343
Canyà,	1670	278	327	55	1997	333
Tulà,	1670	278	327	55	1997	333
Vrischica,	1795	299	268	45	2063	343
Dhanu,	1935	323	110	18	2045	341
Macara,	1935	323	110	18	1825	304
Cúmbha,	1795	299	268	45	1527	255
Mína.	1670	278	327	55	1343	224
	21600	3600			21600	3600



THE COMPUTATION OF THE ECLIPSE.

Let it be premised that the position of the sun, moon, and nodes, by calculation, will on the first of next *Vaisác'h* be as here represented in the *Hindu* manner, excepting the characters of the signs.

By inspection of the figure, and by considering the motion of the sun, moon, and nodes, it appears that, when the sun comes to the sign *Tulà, Libra*, corresponding with the month of *Cártic*, the descending node will have gone back to *Aries;* and that consequently a *lunar* eclipse may be expected to happen at the end of the *pu'rnimà tit'hi*, or time of full moon, in that month.

FIRST OPERATION.

To find the number of mean solar days from the creation to some part of the *pu'rnimà tit'hi* in *Cártic*, of the 4891st year of the *Cali Yug*.

Years expired of the *Calpa* to the end of the *Satya Yug*, ...	1970784000
Deduct the term of *Brahmá's* employment in the creation, ...	17064000
From the creation, when the planetary motions began, to the end of the *Satya Yug*, ...	1953720000
Add the *Trétà Yug*, ...	1296000
Dwápar Yug, ...	864000
Present year of the *Cali Yug*, ...	4890
From the creation to the next approaching *Bengal year*, ...	1955884890
Or solar months, (× 12)	23470618680
Add seven months, ...	72
	23470618680

As the solar months in a *Yug*, 51840000, are to the intercalary *lunar* months in that cycle, 1593336, so are the solar months 23470618687, to their corresponding intercalary *lunar* months 721384677; which added together, give 24192003364 lunations. This number multiplied by thirty produces 725760100920 *tit'his*, or lunar days, from the creation to the new moon in *Cartic;* to which add fourteen *tit'his* for the same, to the *púrnimà tit'his* in that month 725760100934. Then, as the number of *tit'his* in a *Yug* 1603000080, is to their difference exceeding the mean solar days in that cycle (called *cshaya tit'his)* 25082252, so are 725760100934 *tit'his*, to their excess in number over the solar days 11356017987, which subtracted, leaves 714404082947, as the number of mean solar days from the creation, or when the planetary motions began, to a point of time which will be midnight under the first meridian of *Lancà*, and near the time of full moon in *Cártic**. The first day after the creation being *Ravi-vár*, or *Sunday*, divide the number of days by seven for the day of the week, the remainder after the division being two, marks the day *Sóma-vár*, or *Monday*.

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* In the year of the *Cali Yug* 4891, corresponding with 1196 *Bengal* style, and with the month or *October* or *November* (hereafter to be determined) in the year of *Christ* 1789.

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SECOND OPERATION.

For the mean longitude of the sun, moon, and the ascending node. Say, as the number of mean solar days in a *Mahá Yug* is to the revolutions of any planet in that cycle, so are the days from the creation to even revolutions, which reject, and the fraction, if any, turned into sines, &c. is the mean longitude required.

1st. Of the Sun.

$$\frac{714404082947 \times 4320000}{1577917828} = \begin{array}{cccccc} \textit{Revolutions,} & \textit{Sines,} & {}^{\circ} & ' & '' & ''' \\ (1955884890) & 6 & 22 & 44 & 2 & 12 \end{array}$$

2d. Of the Moon.

$$\frac{714404082947 \times 57753336}{1577917828} = (26147888255) \quad 0 \quad 21 \quad 21 \quad 58 \quad 56$$

3d. Of the Moon's Apogee.

$$\frac{714404082947 \times 488203}{1577917828} = (221034460) \quad 11 \quad 5 \quad 31 \quad 13 \quad 35$$

Correction of the *Bíja* add.

$$\frac{714404082947 \times 4}{1577917828} = (\ldots\ldots\ldots\ldots\ldots) \quad \begin{array}{ccccc} 0 & 37 & 37 & 52 & 28 \\ \hline 11 & 7 & 9 & 6 & 3 \end{array}$$

4th. Of the Moon's ascending Node.

$$\frac{714404082947 \times 232238}{1577917828} = (105147017) \quad 4 \quad 27 \quad 49 \quad 48 \quad —$$

Correction of the *Bíja* add.

$$\frac{714404082947 \times 4}{1577917828} = (\ldots\ldots\ldots\ldots\ldots) \quad \begin{array}{ccccc} 0 & 1 & 37 & 52 & 28 \\ \hline 4 & 29 & 27 & 40 & 28 \end{array}$$

5th. Of the Sun's Apogee.

$$\frac{714404082947 \times 387}{1577917828} = (\ldots.\ 175\ \ldots.) \quad 2 \quad 17 \quad 17 \quad 15 \quad —$$

	Mean longitude for midnight under the meridian of Lancà.	*Deduct for the longitude of* Bhágulpur *as* * 8° 50′ *of the equator east.*	*Mean longitude for midnight at* Bhágalpur.
	s ° ′ ″ ‴	′ ″	
Of the Sun,	6 21 44 2 12	1 27	6 21 42 35 12
Moon,	— 21 21 58 56	19 34	— 21 2 25 —
Node,	4 29 27 40 28	— 4	4 29 27 36 —
Sun's Apogee,	2 17 17 15 —	inconsiderable	2 17 17 16 —
Moon's Apogee,	11 7 9 6 3	— 9	11 7 8 57 —

THIRD OPERATION.

For the equated longitude of the Sun and Moon, &c.

1st. *Of the Sun.*

The mean longitude of the sun is $6^s\ 21^\circ\ 42'\ 35''\ 12'''$; of the apogee 2 17 17 15, the difference, or mean anomaly, $4^s\ 4^\circ\ 25'\ 20''$; its complement to 6 signs or distance from the perigee $1^s\ 25^\circ\ 34'\ 40''$, the equation for which is required. This may either be taken from the foregoing table, translated from *Macaranda*, or calculated in the manner explained as follows:

The sine of $1^s\ 25^\circ\ 34'\ 40''$ is $2835'\ 31''$ and $\frac{2835'\ 31'' \times 20'}{3438'} = 14'\ 30''$ to be subtracted from the *paridhi* degrees in *sama*; $14^\circ - 14'\ 30'' = 13^\circ\ 53'\ 30''$, the circumference of the epicycle in this point of anomaly; and $\frac{13^\circ\ 43'\ 30'' \times 2835'\ 31''}{360^\circ} = 108'\ 61''$ the sine of the angle of equation, considered as equal to its arc, or $1^\circ\ 48'\ 6''$, to be deducted from the mean, for the true longitude; $6^s\ 21^\circ\ 42'\ 35'' - 1^\circ\ 48'\ 6'' = 6^s\ 19^\circ\ 54'\ 29''$ for midnight agreeing with mean time; but as, in this point of anomaly, the true or apparent midnight precedes that estimated for mean time, for which the computation has been made, a proportionable quantity must be deducted from the sun's place, which is thus found: Say, as the minutes contained in the ecliptic

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* This longitude, assigned to *Bhdgalpur*, is erroneous; but the error does not in the least affect the main object of the paper.

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are to the sun's mean motion in one day 59′ 8″, so is the equation of his mean to his true place 180′ 6″, to the equation of time required, 0′ 18″ $\left(=\frac{59'\ 8''\times 108'\ 6''}{21600}\right)$ and 6^s 19° 54′ 29″—18″=6^s 19° 54′ 11″ the sun's true longitude for the apparent midnight.

For the sun's true motion. The co-sine of the sun's distance from the perigee is 1941′ 0″ 1‴, and $\frac{1941'\ 0''\ 1'''\times 13\ 43\ 30}{360^\circ}=74'$ the co-sine of the epicycle, and $\frac{59'\ 8''\times 74}{3438}=1'\ 16''$ equation, to be added to the mean for the true motion, 59′ 8″ × 1′ 16″=60′ 24″ per day, or 60″ 24‴ per *danda*.

2d. *Of the Moon.*

The Moon's mean longitude for the mean midnight is 0^s 21° 2′ 25″, which exceeds her mean longitude for the true midnight, but $\frac{108\times 790\ 1\ 35}{21600}=3'\ 57''$, her motion in the difference of time between the mean and true midnight 0^s 21° 2′ 25″—3′ 57″= 0 20 58 28 mean longitude, for which the anomalistic equation is to be found. Place of the apogee 11^s 7° 8′ 55″ and the moon's distance from it 1^s 13° 49′ 33″. The sine of the latter, 2379′ 39″. By the rule before explained $\frac{2379'\ 39''\times 20'}{3438}=13'\ 51''$, and $\frac{32^\circ - 13'\ 51''\times 2379'\ 39''}{360}$ =210′ the sine of the angle of equation equal to its arc, or 3° 30″ to be subtracted, 0° 20′ 58″ 28‴—3° 30″=0° 17′ 28″ 28‴ the moon's true place, agreeing with the true or apparent midnight.

For the moon's true motion. The co-sine of her distance from the apogee 2479. 13. Circumference of the epicycle 31° 46′ 9″, and $\frac{31^\circ\ 46'\ 9''\times 2479'\ 13''}{360^\circ}=218'\ 47''$ co-sine in the epicycle. The moon's mean motion from her apogee is 790′ 35″—6′ 41″=783′ 54″, and $\frac{783'\ 54''\times 218'\ 47''}{3438'}=49'\ 53''$ the equation of her mean to her true motion, to be subtracted, 790. 35—49. 53=740 42 the moon's true motion per day, or 740″ 42‴ per *danda*.

For the place of the moon's apogee reduced to the apparent midnight. The motion of the apogee is 6′ 41″ per day. $\frac{108' \; 6'' \times 6' \; 41''}{21600'} = 2''$, $11^s \; 7^\circ \; 8' \; 57'' - 2'' = 11^s \; 7^\circ \; 8' \; 55''$ its place.

For the same of the node. Its motion per day is 3′ 11″, and $\frac{108' \; 6'' \times 3' \; 11''}{21600'} = 1''$, and $4^s \; 29^\circ \; 27' \; 36'' - 1'' = 4^s \; 29^\circ \; 27' \; 35''$ its place.

The true longitude and motion, therefore, for the apparent time of midnight at *Bhágalpur*, 714404082947 solar days after the creation, or commencement of the planetary motions, will be

	Longitude.				*Motion per day.*	
	s	°	′	″	′	″
Of the Sun,	6	19	54	11	60	24
Moon,	—	17	28	28	740	42
Sun's Apogee,	2	17	17	15	inconsiderable	
Moon's Apogee,	11	7	8	55	6	41
Moon's Node,	4	29	27	35	3	11

FOURTH OPERATION.

Having the longitude and motion as above, to determine the *tit'hi* and time remaining unexpired to the instant of opposition, or full moon.

The moon's longitude subtracted from the sun's, leaves $5^s \; 27^\circ \; 34' \; 17''$, or 10654′ 17″, which, divided by 720′, the minutes in a mean *tit'hi*, quotes fourteen even *tit'his* expired, and the fraction, or remainder 574′ 17″, is the portion expired of the 15th, or *púrnimà tit'hi*, which subtracted from 720′, leaves 145′ 43″ remaining unexpired of the same; which, divided by the moon's motion per *danda* from the sun, will give the time remaining unexpired from midnight to the instant of full moon with as much precision as the *Hindu* astronomy requires. Deduct the sun's motion 60″ 24‴ per *danda* from the moon's 740″ 42‴, the remainder 680″ 8‴, is the moon's motion from the sun; by this divide the part remaining unexpired of the *púrnimà tit'hi* 145′ 43″.

$$\frac{145' \; 43'' = 524580'''}{680'' \; 8''' = 40818'''} = \overset{\text{D.}}{12} \; \overset{\text{P.}}{51}$$

therefore 12 *dandas*, 51 *palas* after midnight will be the end of the *púrnimà tit'hi*, or instant of opposition of the sun and moon.

FIFTH OPERATION.

Having the instant of opposition as above, to find the true longitude and motion of the sun and moon, the latitude of the latter, and the place of the node.

Add the mean motion of each for $\overset{D}{12}\ \overset{P.}{51}$ to the mean place, found before for the true midnight ; and for the mean places so found, compute again the anomalistic equations. This being but a repetition of operation, the third is unnecessary to be detailed. These several particulars are as follows :

	Mean longitude for midnight.	*Mean longitude at full moon.*	*Equation.*	*True longitude at full moon.*
	s ° ′ ″	s ° ′ ″	° ′ ″	s ° ′ ″
Of the Sun,	6 21 42 17	6 21 54 17	1 47 50	6 20 7 7
Moon,	— 20 58 28	— 23 47 47	3 40 20	– 20 7 27
Moon's Apogee,	11 7 8 55	11 7 10 21	—— —	—— ——
Moon's Node,	4 29 27 35	4 29 28 16	—— —	—— ——

	Mean motion.	*Equation.*	*True motion at full moon.*
Of the Sun,	59′ 8″	× 1′ 16″	60′ 24″
Moon,	790 35	— 47 28	743 7

Hence it appears that, at the opposition, the moon will be near her descending node ; for, $4^s\ 29^\circ\ 28'\ 16'' \times 6^s = 10^s\ 29^\circ\ 28'\ 16''$, the place of the descending node *in antecedentia*, and $12^s - 10^s\ 29^\circ\ 28'\ 16'' = 1^s\ 0^\circ\ 31'\ 44''$ its longitude according to the order of the signs, and $1^s\ 0^\circ\ 31'\ 44'' - 20^\circ\ 7'\ 27'' = 10^\circ\ 24'\ 17''$ the moon's distance from her descending node, which, being within the limit of a lunar eclipse, shows that the moon will be then eclipsed. For her latitude at this time, say, as radius is to the inclination of her orbit to the ecliptic, 4° 30′ or 270′, so is the sine of her distance from the node 620′ 57″, to her latitude 48′ 45″ $\left(=\frac{279'' \times 620'\ 57''}{3438'}\right)$.

SIXTH OPERATION.

From the elements now found, to compute the diameters of the moon and shadow, and the duration of the eclipse.

	Yójan.
The Sun's mean diameter is	6500
Moon's	480
Earth's	1600

Sun's mean motion, ...	59′	8″
Moon's, ...	790	35
Sun's true motion, ...	60	24
Moon's, ...	743	7
Moon's latitude, ...	48	45

As the moon's mean motion is to her mean diameter, so is her true motion to her true diameter for the time of opposition $\frac{743'\ 7''\times\overset{\text{Y.}}{480}}{790,\ 35}=451\ 11$ *Yójan*, which, divided by fifteen, quotes 30′ 5″ of a great circle.

As the sun's mean motion is to his mean diameter, so is his true motion to his diameter at the instant of opposition $\frac{60'\ 24''\times\overset{\text{Y.}}{6500}}{59'\ 8'}=6639\ 14$ *Yójan*.

As the moon's mean motion is to the earth's diameter, so is the moon's equated motion to the *Súchì*, or a fourth number, which must be taken as the earth's diameter, for the purpose of proportioning its shadow to the moon's distance and apparent diameter $\frac{1600\times743'\ 7''}{790\ 35''}=1503\ 56$ *Yójan*, the *Súchì*.

Equated diameter of the sun, ...	6639	14
Of the earth, ...	1503	56
Difference,	5039	14

As the sun's mean diameter is to the moon's mean diameter, so is the difference above 5039 14, to a fourth number, which deducted

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from the *Súchi*, or equated diameter of the earth, leaves the diameter of the earth's shadow at the moon, $\frac{\overset{Y}{480}\times\overset{Y}{5039}\ 14}{6500}=372.\ 7$, and $1503.\ 56-372.\ 7=1131.\ 49$ *Yójan*, which divided by fifteen, quotes 75′ 27″ of a great circle for the same.

From the half sum of the diameters of the moon and shadow $\frac{75'\ 27''\times30'\ 5''}{2}=52'\ 46''$, subtract the moon's latitude 48′ 45″, the remainder is the *Ch'channa*, or portion of the moon's diameter eclipsed, 4′ 1″ of a great circle, and by the nature of a right angled triangle, the square root of the difference of the squares of the moon's latitude, and the half sum of the diameters of the shadow and moon, will be the path of the moon's centre, from the beginning to the middle of the eclipse.

The diameter of the shadow is,	...	75	27
Of the moon, ...	...	30	5
Sum, ...	...	105	32
Half sum,	...	52	46
The moon's latitude is, ...	...	48	45

$\sqrt{52.\ 46^2\times48.\ 45^2}=20'\ 11''$ which, divided by the moon's motion from the sun, quotes the half duration of the eclipse in *dandas* and *palas*, or *Hindu* mean solar hours, $\frac{20'\ 11''=1211''}{682''\ 43'''}=\overset{D}{1}\ \overset{P}{46}\ \overset{V}{25}$; which doubled, is $\overset{D}{3}\ \overset{P}{32}\ \overset{V}{50}$, the whole duration of the eclipse; which will be partial, the moon's latitude being greater than the difference between the semi-diameters of the moon's disk and the earth's shadow.

SEVENTH OPERATION.

To find the position of the equinoctial colures, and thence the declination of the sun, the length of day and night, and the time counted from sunrise, or hour of the civil day when the eclipse will happen.

1*st.* For the *ayanánsa* or distance of the vernal equinox from the 1st of *Mésha.* $\frac{714404082947 \times 600}{1577917828} = \overset{\textit{Periods.}}{(271650)}\ 8^s\ 4^\circ\ 31'\ 30''\ 52'''$ of which take the *bhuja* $8^s\ 4^\circ\ 31'\ 30''\ 52''' - 6^s = 2^s\ 4^\circ\ 31'\ 30''\ 52'''$ which multiply by three, and divide by ten, $\frac{64^\circ\ 31'\ 30''\ 52 \times 3}{10} = 19^\circ\ 2'\ 27''$ the *ayanánsa*, which in the present age is added to the sun's longitude, to find his distance from the vernal equinox. The sun's equated longitude is $6^s\ 19^\circ\ 54'\ 11''$, and $6^s\ 19^\circ\ 54'\ 11'' \times 19^\circ\ 21'\ 27'' = 7^s\ 9^\circ\ 15'\ 38''$ his distance from the vernal equinox.

2*d.* For the declination, right ascension, and ascensional difference. The sun's place is $7^s\ 9^\circ\ 15'\ 38''$, and $1^s\ 9^\circ\ 15'\ 38''$ his distance from the autumnal equinox; the sine of which is $2174'\ 41''$, and as radius is to the sine of the greatest declination 24°, termed the *paramápacramajya* $1397'$, so is 2174. 41 to the sine of his declination $883'\ 40''$, the arc corresponding with which, in the canon of sines, is $14^\circ\ 53'$, $(\frac{1397' \times 2174'\ 41''}{3438} = 883'\ 40'')$. The equinoc-
A V
tial shadow at *Bhágalpur* is 5, 30, and, as the *Gnomon* of twelve *angalas* is to the equinoctial shadow, so is the sine of the declination 883. 40, to the *cshitijya*, $\frac{\overset{A}{5}\ \overset{V}{30} \times 883'\ 40''}{3438} = 405'\ 1''$. And as the co-sine of the declination is to radius, so is the *cshitijya* to the sine of the *chara*, or ascensional difference, $\frac{405\ 1 \times 3438}{3322.\ 36} = 419'\ 4''$: its arc is $419'\ 56''$ the ascensional difference.

3*d.* For the length of the day and night.

The modern *Hindus* make their computations in mean solar time; the *Súrya Siddhánta* directs, that they should be made in sydereal time. A sydereal day contains sixty *dandas;* each *danda*, sixty *viculas;* and each *vicula* six respirations, in all 21600 respirations answering to the minutes of the equator. A *nacshatra* day is exceeded in length by the *sávan* or solar day by reason of the sun's proper motion in the ecliptic, the former measures time equably, but the latter varies in its length from the inequality of the sun's motion, and the obliquity of the ecliptic. The sun's equated motion for the middle of the eclipse was found 60′ 24″; and the oblique ascension for the eighth sign from the vernal equinox, in which he will be found at that time, is taken from the foregoing table 343 *palas*, or 2058 respirations. As the number of minutes contained in one sine 1800, is to the number of respirations, or the arc of the equator in minutes answering to the oblique ascension of the sine, the sun is in 2058, as above, so is the equated motion 60′ 24″, to the excess in respirations of the *sávan* or solar day over the *nacshatra* or sydereal day $\frac{2058' \times 60'\,24''}{1800} = 69'\ 3''$; which added to 21600′ gives the length of the solar day by civil account from sunrise to sunrise, sydereal time 21669. 3 respirations. From one-fourth of this deduct the ascensional difference, the sun being declined towards the south pole, for the semidiurnal arc; and add it for the seminocturnal arc: the former is 4997′ 19″, and the latter 5837′ 11″; which may be reduced to *dandas* or *Hindu* hours by a division of 360. Hence half the day is $\overset{D}{13}\ \overset{P}{52}\ \overset{V}{53}$, and half the night $\overset{D}{16}\ \overset{P}{12}\ \overset{V}{52}$. The whole day added to half the night shows the hour counted from the preceding sunrise to midnight $\overset{D}{43}\ \overset{P}{58}\ \overset{V}{38}$, to which add the time at midnight unexpired of the *púrnimá tit'hi*, for the hour of the civil day corresponding with the middle of the eclipse. The hour from midnight to the end of the *púrnimá tit'hi* is already found $\overset{D}{12}\ \overset{P}{51}$ in mean solar time, and to reduce it to sydereal time, say, as 21600′ is to 21600′ × 59′ 8″, so is $\overset{D}{12}\ \overset{P}{51}$, to sidereal hours $\overset{D}{12}\ \overset{P}{53}$, equal to $\overset{D}{12}\ \overset{P}{51}$ solar hours.

	D	*P*	*V*
From the preceding sunrise to midnight is, ...	43	59	—
At midnight will remain of the *púrnimá ti'thi*, ...	12	53	—
Hour of the civil day at the middle of the eclipse,	56	52	—
Deduct the half duration, ...	1	46	25
Beginning of the eclipse, ...	55	5	35
Add the whole duration, ...	3	32	50
End of the eclipse, ...	58	38	25

And the day and night containing together $\overset{D}{60}\ \overset{P}{11}\ \overset{V}{30}$, the eclipse should end $\overset{D}{1}\ \overset{P}{33}\ \overset{V}{5}$ before sunrise, according to this calculation.

The first day after the creation according to the *Hindus*, was *ravi-vár*, or *Sunday :* the number of days for which the above calculation has been made, is 714404082947, which divided by seven, the number of days in a week are 12057726135 weeks and two days ; the astronomical day therefore of *soma-vár*, or *Monday*, will end at midnight preceding the eclipse ; but the *soma-vár* by civil computation will continue to the next ensuing sunrise, and this *soma-vár*, by calculating the number of days elapsed from the instant the sun entered the sign *Tulà*, to his advance of 19° 54′ on that sign, will be found to fall on the 19th of the month of *Cártic*, answering to the 3d of November.

The time of the full moon and the duration of the eclipse, found by this computation, differ considerably from the Nautical Almanac. The *Siddhánta Rahasya* and *Grahalághava*, comparatively modern treatises, are nearer the truth, yet far from correct. The *Hindus*, in determining these phenomena, are satisfied when within a few minutes of the true time.

A comparative statement of this eclipse as predicted in the Nautical Almanac, with computations of it made by different Hindu books. Those marked (*) are made for different meridians, the last I believe for Tirhút.

NAMES.	Equated longitude for midnight at *Bhágalpur*, supposed in 8° 50′ E. from *Lancà*, and 88° E. from *Greenwich*.		
	The Sun.	*The Moon.*	*The Node.*
	s ° ′ ″	s ° ′ ″	
Súrya Siddhánta,	6 19 54 11	— 17 28 28	1 — 31 44
Tables of Macaranda,	6 19 55 9	— 17 30 9	1 — 32 7
* Grahalághava,			
Siddhánta Rahasya,	6 19 54 29	— 17 16 25	1 — 27 35
	Add to each the *ayanánsa* 19° 21′ 27″ for the longitude counted according to *European* astronomers from the Equinoctial colure.		
	s ° ′ ″	s ° ′ ″	s ° ′ ″
Súrya Siddhánta,	7 9 15 38	1 6 49 55	1 19 53 11
Tables of Macaranda,	7 9 16 36	1 6 51 36	1 19 53 54
* Grahalághava,			
Siddhánta Rahasya,	7 9 15 56	1 6 37 52	1 19 49 2
Nautical Almanac,	7 10 47 8	1 7 50 58	1 19 45 30

	From midnight to the middle of the Eclipse.		Duration of the Eclipse.	
	Hindu time.	*English time.*	*Hindu time.*	*English time.*
	D. P. V.	H. M. S.	D. P. V.	H. M. S.
Súrya Siddhánta,	12 53 —	5 9 12	3 12 50	1 17 8
Tables of Macaranda,			4 50 —	1 46 20
* Grahalághava,	*14 50 —	5 56 —	5 18 —	1 56 36
Siddhánta Rahasya,	13 53 —	5 33 —	4 58 —	1 49 16
* Grahana Málà, a Catalogue of Eclipses,	16 6 —	6 26 24	5 26 —	2 10 24
Nautical Almanac,	16 — 37	6 24 15	5 22 2½	2 9 —

XVI.

On the ANTIQUITY *of the* INDIAN ZODIAC.

By the PRESIDENT.

I ENGAGE to support an opinion (which the learned and industrious M. *Montucla* seems to treat with extreme contempt) that the *Indian* division of the Zodiac was not borrowed from the *Greeks* or *Arabs*, but, having been known in this country from time immemorial, and being the same in part with that used by other nations of the old *Hindu* race, was probably invented by the first progenitors of that race before their dispersion. "The *Indians*," he says, "have two divisions of the Zodiac; one, like that of the "*Arabs*, relating to the moon, and consisting of *twenty-seven* equal "parts, by which they can tell very nearly the hour of the night; "another relating to the sun, and, like ours, containing twelve signs, "to which they have given as many names, corresponding with "those which we have borrowed from the *Greeks*." All that is true; but he adds, "It is highly probable that they received them at some "time or another by the intervention of the *Arabs;* for no man, "surely, can persuade himself, that it is the ancient division of the "Zodiac formed, according to some authors, by the forefathers of "mankind, and still preserved among the *Hindus*." Now I undertake to prove, that the *Indian* Zodiac was not borrowed mediately or directly from the *Arabs* or *Greeks;* and, since the solar division of it in *India* is the same in substance with that used in *Greece*, we may reasonably conclude, that both *Greeks* and *Hindus* received it from an older nation, who first gave names to the luminaries of heaven, and from whom both *Greeks* and *Hindus*, as their similarity in language and religion fully evinces, had a common descent.

The same writer afterwards intimates, that "the time when "*Indian* astronomy received its most considerable improvement, "from which it has now, as he imagines, wholly declined, was either "the age when the *Arabs*, who established themselves in *Persia* "and *Sogdiana*, had a great intercourse with the *Hindus*, or that, "when the successors of *Chengiz* united both *Arabs* and *Hindus* "under one vast dominion." It is not the object of this essay to correct the historical errors in the passage last-cited, nor to defend the astronomers of *India* from the charge of gross ignorance in regard to the figure of the earth and the distances of the heavenly bodies: a charge, which *Montucla* very boldly makes on the authority, I believe, of father *Souciet.* I will only remark, that, in our conversations with the *Pandits*, we must never confound the system of the *Jyautishicas* or mathematical astronomers, with that of the *Pauránicas*, or poetical fabulists; for to such a confusion alone must we impute the many mistakes of *Europeans* on the subject of *Indian* science. A venerable mathematician of this province, named *Rámachandra,* now in his eightieth year, visited me lately at *Crĭshnanagar ;* and part of his discourse was so applicable to the inquiries, which I was then making, that, as soon as he left me, I committed it to writing. "The *Pauránics,*" he said, "will tell you, that our earth is a plane figure studded with eight "mountains, and surrounded by seven seas of milk, nectar, and "other fluids; that the part which we inhabit is one of seven "islands, to which eleven smaller isles are subordinate; that a God, "riding on a huge *elephant*, guards each of the eight regions; and "that a mountain of gold rises and gleams in the centre; but we "believe the earth to be shaped like a *Cadamba* fruit, or spheroidal, "and admit only four oceans of salt water, all which we name "from the four cardinal points, and in which are many great peninsulas, with innumerable islands. They will tell you that a dragon's head swallows the moon, and thus causes an eclipse; but "we know that the supposed head and tail of the dragon mean "only the nodes, or points formed by intersections of the ecliptic "and moon's orbit. In short, they have imagined a system which "exists only in their fancy; but we consider nothing as true without such evidence as cannot be questioned." I could not perfectly understand the old Gymnosophist, when he told me that the *Rás'ichacra*, or *Circle of Signs* (for so he called the Zodiac) was like a *Dhustúra* flower; meaning the *Datura*, to which the *Sanscrit* name has been softened, and the flower of which is conical, or shaped like a funnel. At first I thought that he alluded to a projection of the hemisphere on the plane of the colure, and to the angle formed by the ecliptic and equator; but a younger astronomer, named *Vinâyaca*, who came forward to see me, assured me that they meant only the circular mouth of the funnel, or the base of the cone; and that it was usual among their ancient writers to borrow from fruits and flowers their appelations of several plane and solid figures.

From the two *Bráhmans*, whom I have just named, I learned the following curious particulars; and you may depend on my accuracy in repeating them, since I wrote them in their presence, as well as corrected what I had written, till they pronounced it perfect. They divide a great circle, as we do, into three hundred and sixty degrees, called by them *ansas*, or *portions;* of which they, like us, allot thirty to each of the twelve signs, in this order:

Mésha, the Ram.
Vrĭsha, the Bull.
Mit'huna, the Pair.
4. *Carcat'a*, the Crab.
Siṅha, the Lion.
Canyà, the Virgin.
Tulà, the Balance.
8. *Vrĭshchica*, the Scorpion.
Dhanus, the Bow.
Macara, the Sea-Monster.
Cúmbha, the Ewer.
12. *Mína*, the Fish.

The figures of the twelve asterisms, thus denominated with respect to the sun, are specified by *Srípeti*, author of the *Retnamálà*, in *Sanscrit* verses; which I produce as my vouchers in the original, with a verbal translation:

Méshádayó náma samánarúpì,
Vínágadádhyam mit'hunam nrĭyugmam,
Pradípaśasyé dadhatí carábhyám
Návi st'hitá várińi canyacaiva.
Tulá tulábhrĭt pretimánapánir
Dhanur dhanushmán hayawat parángah,
Mrĭgánanah syáu macaró't'ha cumbhah
Scandhé neró rictaghátam dadhánah,
Anyanyapuchch'hábhimuc'hó hi mínah
Matsyadwayam swast'halachárinómì.

"The *ram*, *bull*, *crab*, *lion*, and *scorpion*, have the figures of "those five animals respectively: the *pair* are a damsel playing on "a *Vínà*, and a youth wielding a mace; the *virgin* stands on a "boat in water, holding in one hand a lamp, in the other an ear "of rice-corn; the *balance* is held by a weigher with a weight in "one hand; the *bow*, by an archer, whose hinder parts are like "those of a horse; the *sea-monster* has the face of an antelope; "the *ewer* is a waterpot borne on the shoulder of a man, who "empties it; the *fish* are two with their heads turned to each other's "tails: and all these are supposed to be in such places as suit "their several natures."

To each of the *twenty-seven* lunar stations, which they call *nachastras*, they allow thirteen *ansas* and one third, or *thirteen degrees twenty minutes*; and their names appear in the order of the signs, but without any regard to the figures of them:

Aświnì.
Bharanì.
Crĭticà.
Róhiní.
Mrĭgasiras.
A'rdrà.
Punarvasu.
Pushya.
9. Aśléshà.

Maghà
Púrva p'halgunì.
Uttara *p'halgunì.*
Hastà.
Chitrà.
Swátì.
Vìsác'hà.
Anurádhà.
18. *Jyésht'hà.*

Múlà.
Púrv*áshá'dhá.*
Uttarásha'dhà.
Srávanà.
Dhanisht'à.
Satabhishà.
Púrva *bhádrapadà.*
Uttarabhádrapadà.
27. Révatì.

Between the twenty-first and twenty-second constellations, we find in the plate three stars, called *Abhijit;* but they are the last quarter of the asterism immediately preceding, or the later *Ashár,* as the word is commonly pronounced. A complete revolution of the moon, with respect to the stars, being made in twenty-seven days, odd hours, minutes, and seconds, and perfect exactness being either not attained by the *Hindus*, or not required by them, they fixed on the number twenty-seven, and inserted *Abhijit* for some astrological purpose in their nuptial ceremonies. The drawing, from which the plate was engraved, seems intended to represent the figures of the twenty-seven constellations, together with *Abhijit*, as they are described in three stanzas by the author of the *Retnamálà:*

1. Turagamuc'hasadrĭcsham yónirúpam cshurábham,
Sacátasamam at'haińasyóttamángéna tulyam,
Mańigrĭhaśara chacrábháni śálópamam bham,
Sayanasadrĭśamanyachchátra paryancarúpam.

2. Hastácárayutam cha maucticasamam
chányat praválópamam,
Dhrĭshyam tórana sannibham balinibham,
satcuńďalábham param;
Crudhyatcésarivicraména sadrĭśam,
śayyásamánam param,
Anyad dentivilásavat st'hitamatah
śrĭngáťacavyacti bham.

3. Trivicramábham cha mrĭdangarúpam,
Vrĭttam tatónyadyamalábhwayábham,
Paryancarúpam murajánucáram,
Ityévam aśwádibhachacrarúpam.

"A horse's head, *yóni* or *bhaga*, a razor, a wheeled carriage, "the head of an antelope, a gem, a house, an arrow, a wheel, another "house, a bedstead, another bedstead, a hand, a pearl, a piece of coral, "a festoon of leaves, an oblation to the Gods, a rich ear-ring, the "tail of a fierce lion, a couch, the tooth of a wanton elephant, near "which is the kernel of the *s'rĭngátaca* nut, the three footsteps of "*Vishnu*, a tabor, a circular jewel, a two-faced image, another couch, "and a smaller sort of tabor; such are the figures of *Aswinì* and "the rest in the circle of lunar constellations."

The *Hindu* draughtsman has very ill represented most of the figures; and he has transposed the two *Ashádras* as well as the two *Bhadrapads;* but his figure of *Abhijit*, which looks like our ace of hearts, has a resemblance to the kernel of the *trapa:* a curious water-plant described in a separate essay. In another *Sanscrit* book the figures of the same constellations are thus varied:

A horse's head.
Yóni, or *bhaga*.
A flame.
A waggon.
A cat's paw.
One bright star.
A bow.
A child's pencil.
9. A dog's tail.
A straight tail.
Two stars S. to N.
Two, N. to S.
A hand.
A pearl.
Red saffron.
A festoon.
A snake.
18. A boar's head.
A couch.
A winnowing fan.
Another.
An arrow.
A tabor.
A circle of stars.
A staff for burdens.
The beam of a balance.
27. A fish.

From twelve of the asterisms just enumerated are derived the names of the twelve *Indian* months, in the usual form of patronymics; for the *Pauránics*, who reduce all nature to a system of emblematical mythology, suppose a celestial nymph to preside over each of the constellations, and feign that the God *Sóma*, or *Lunus* having wedded twelve of them, became the father of twelve *Genii*, or Months, who are named after their several mothers; but the *Jyautishicas* assert, that, when their lunar year was arranged by former astronomers, the moon was at the full in each month on the very day when it entered the *nacshatra*, from which that month is denominated. The manner in which the derivatives are formed, will best appear by a comparison of the months with their several constellations

A'świna.
Cártica.
Márgaśírsha.
4. Pausha.
Mágha.
P'hálguna.
Chaitra.
8. Vaisác'ha.
Jyaish't'ha.
A'shára.
Srávana.
12. Bhádra.

The third month is also called *A'grahdyana* (whence the common word *Agran* is corrupted) from another name of *Mrĭgas'iras.*

Nothing can be more ingenious than the memorial verses, in which the *Hindus* have a custom of linking together a number of ideas otherwise unconnected, and of chaining, as it were, the memory by a regular measure: thus by putting *teeth* for thirty-two *Rudra* for eleven, *season* for six, *arrow* or *element* for five, *ocean*, *Véda*, or *age*, for four, *Ráma*, *fire*, or *quality* for three, *eye*, or *Cumára* for two, and *earth* or *moon* for one, they have composed four lines, which express the number of stars in each of the twenty-seven asterisms :

Vahni tri rĭtwishu gunéndu critágnibhúta,
Bánáświnétra śara bhúcu yugábdhi rámáh,
Rudrábdhirámagunavédaśatá dwiyugma,
Dentá budhairabhihitáh cramaśó bhatáráh.

That is, " three, three, six ; five, three, one ; four, three, five ; " five, two, two ; five, one, one ; four, four, three ; eleven, four, and " three ; three, four, an hundred ; two, two, thirty-two. Thus have " the stars of the lunar constellations, in the order as they appear, " been numbered by the wise."

If the stanza was correctly repeated to me, the *two Ashárás* are considered as one asterism, and *Abhijit* as three separate stars ; but I suspect an error in the third line, because *dwibána*, or *two and five* would suit the metre as well as *bdhiráma ;* and because there were only three *Védas* in the early age, when, it is probable, the stars were enumerated and the technical verse composed.

Two lunar stations, or *mansions*, and a quarter are co-extensive, we see, with one sign ; and nine stations correspond with four signs. By counting, therefore, thirteen degrees and twenty minutes from the first star in the head of the Ram, inclusively, we find the whole extent of *Aswinì*, and shall be able to ascertain the other stars with sufficient accuracy ; but first let us exhibit a comparative table of both *Zodiacs*, denoting the mansions, as in the *Váránes* almanac, by the first letters or syllables of their names :

Months.	*Solar Asterisms.*	*Mansions.*
A'swin	Mésh	A + bh + $\frac{c}{4}$
Cártic	Vrĭsh	$\frac{3c}{4}$ + rò + $\frac{M}{2}$
Agraháyan	Mit'hun	$\frac{M}{2}$ + á + $\frac{3P}{4}$
Paush	Carcat 4.	$\frac{P}{4}$ + p + śl. 9.
Mágh	Siṅh	m + PU + $\frac{U}{4}$
P'hálgun	Canyà	$\frac{3U}{4}$ + h + $\frac{ch}{2}$
Chaitr	Tulà	$\frac{ch}{2}$ + s + $\frac{3v}{4}$
Vaisác'h	Vrĭschic 8.	$\frac{v}{4}$ + a + j 18.
Jaish't'h	Dhanu	mú + pù + $\frac{u}{4}$
A'shár	Macar	$\frac{3u}{4}$ + S + $\frac{dh}{2}$
Srávan	Chúmbh	$\frac{dh}{2}$ + ś + $\frac{3pú}{4}$
Bhádr	Mín 12.	$\frac{pú}{4}$ + *u* + r. 27

Hence we may readily know the stars in each mansion, as they follow in order :

Lunar Mansions.	*Solar Asterisms.*	*Stars.*
Aswinì	Ram.	*Three*, in and near the head.
Bharanì.	———	*Three*, in the tail.
Crĭticà.	Bull.	*Six*, of the Pleiads.
Róhiní.	———	*Five*, in the head and neck.

Lunar Mansions.	*Solar Asterisms.*	*Stars.*
Mrĭgasiras.	Pair.	*Three*, in or near the feet, perhaps in the Galaxy.
A'rdrà.	———	*One*, on the knee.
Púnarvasù.	———	*Four*, in the heads, breast, and shoulder.
Púshyà.	Crab.	*Three*, in the body and claws.
Asléshà.	Lion	*Five*, in the face and mane.
Maghà.	———	*Five*, in the leg and haunch.
Púrvap'halgúnì.	———	*Two* ; one in the tail.
Uttarap'halgúnì.	Virgin	*Two*, on the arm and zone.
Hastà.	———	*Five*, near the hand.
Chitrà.	———	*One*, in the spike.
Swátì.	Balance	*One*, in the N. Scale.
Vis'ác'hà,	———	*Four*, beyond it.
Anúrádhà.	Scorpion	*Four*, in the body.
Jyésht'hà,	———	*Three*, in the tail.
Múlà.	Bow	*Eleven*, to the point of the arrow.
Púrváshád'hà.	———	*Two*, in the leg.
Uttaráshád'hà.	Sea-monster.	*Two*, in the horn.
Srávanà.	———	*Three*, in the tail.
Dhanisht'à.	Ewer	*Four*, in the arm.
Satabhishà,	———	*Many*, in the stream.
Púrvabhádrapadà	Fish	*Two*, in the first fish.
Uttarabhádrapadà.	———	*Two*, in the cord.
Révatì.	———	*Thirty-two*, in the second fish and cord.

Wherever the *Indian* drawing differs from the memorial verse in the *Retnamálà*, I have preferred the authority of the writer to that of the painter, who has drawn some terrestrial things with so little similitude, that we must not implicitly rely on his representation of objects merely celestial. He seems particularly to have erred in the stars of *Dhanisht'à*.

For the assistance of those who may be inclined to re-examine the twenty-seven constellations with a chart before them, I subjoin a table of the degrees to which the *nacshatras* extend respectively from the first star in the asterism of *Aries*, which we now see near the beginning of the sign *Taurus*, as it was placed in the ancient sphere.

N.	D.	M.	N.	D.	M.	N.	D.	M.
I.	13°.	20′.	X.	133°.	20′.	XIX.	253°.	20′.
II.	26°.	40′.	XI.	146°.	40′.	XX.	266°.	′40.
III.	40°.	0′.	XII.	160°.	0′.	XXI.	280°.	0′.
IV.	53°.	20′.	XIII.	173°.	20′.	XXII.	293°.	20′.
V.	66°.	40′.	XIV.	186°.	40′.	XXIII.	306°.	40′.
VI.	80°.	0′.	XV.	200°.	0′.	XXIV.	320°.	0′.
VII.	93°.	20′.	XVI.	213°.	20′.	XXV.	333°.	20′.
VIII.	106°.	40′.	XVII.	226°.	40′.	XXVI.	346°.	40′.
IX	120°.	0′.	XVIII.	240°.	0′.	XXVII.	360°.	0′.

The asterisms of the *first* column are in the signs of *Taurus*, *Gemini*, *Cancer*, *Leo*; those of the *second*, in *Virgo*, *Libra*, *Scorpio*, *Sagittarius*; and those of the *third*, in *Capricornus*, *Aquarius*, *Pisces*, *Aries*. We cannot err much therefore, in any series of *three* constellations; for, by counting 13° 20′ forwards and backwards, we find the spaces occupied by the two extremes, and the intermediate space belongs of course to the middlemost. It is not meant that the division of the *Hindu* Zodiac into such spaces is exact to a minute, or that *every* star of each asterism must necessarily be found in the space to which it belongs; but the computation will be accurate enough for our purpose, and no lunar mansion can be very remote from the path of the moon. How Father *Souciet* could dream that *Visác'hà* was in the Northern Crown, I can hardly comprehend; but it surpasses all comprehension that M. *Bailly* should copy his dream, and give reasons to support it; especially as four stars, arranged pretty much like those in the *Indian* figure, present themselves obviously near the Balance, or the Scorpion. I have not the boldness to exhibit the individual stars in each mansion, distinguished in *Bayer's* method, by *Greek* letters, because, though I have little doubt that the five stars of *Asléshà*, in the form of a wheel, are η, γ, ζ, μ, ε, of the *Lion*, and those of *Múlà* γ, ε, δ, ζ, φ, τ, σ, ν, ο, ξ, π, of the *Sagittary*: and though I think many of the others equally clear, yet, where the number of stars in a mansion is less than three, or even than four, it is not easy to fix on them with confidence; and I must wait, until some young *Hindu* astronomer, with a good memory and good eyes, can attend my leisure on serene nights at the proper seasons, to point out in the firmament itself the several stars of all the constellations for which he can find names in the *Sanscrit* language. The only stars, except those in the *Zodiac*, that have yet been distinctly named to me, are the *Septarshi*, *Dhruva*, *Arundhatì*, *Vishnupad*, *Mátrimandel;* and, in the southern hemisphere, *Agastya*, or *Canopus.* The twenty-seven *Yóga* stars, indeed, have particular names, in the order of the *nacshatras*, to which they belong; and since we learn* that the *Hindus* have determined *the latitude, longitude, and right ascension of each*, it might be useful to exhibit the list of them: but at present I can only subjoin the names of twenty-seven *Yógas*, or divisions of the Ecliptic.

Vishcambha.
Príti.
A'yushmat.
Saubhágya.
Sóbhana.
Atiganda.
Sucarman.
Dhríti.
Súla.
Ganda.
Vriddhi.
Dhruva.
Vyághàta.
Hershana.
Vajra.
Asrij.
Vyatipáta.
Varíyas.
Parigha.
Siva.
Siddha.
Sádhya.
Subha.
Sucra.
Brahman.
Indra.
Vaidhríti.

Having shown in what manner the *Hindus* arrange the *Zodiacal* stars with respect to the sun and moon, let us proceed to our principal subject, *the antiquity of that double arrangement.* In the first place, the *Bráhmans* were always too proud to borrow their science from the *Greeks*, *Arabs*, *Moguls*, or any nation of *Mléchch'has*, as they call those who are ignorant of the *Védas*, and have not studied the language of the Gods. They have often repeated to me the fragment of an old verse, which they now use proverbially, *na níchò yavanátparah*, or *no base creature can be lower than a Yavan;* by which name they formerly meant an *Ionian* or *Greek*, and now mean a *Mogul*, or generally, a *Muselman.* When I mentioned to different *Pandits*, at several times, and in several places, the opinion of *Montucla*, they could not prevail on themselves to oppose it by serious argument ; but some laughed heartily ; others, with a sarcastic smile, said it was a *pleasant imagination ;* and all seemed to think it a notion bordering on phrenzy. In fact, although the figures of the twelve *Indian* signs bear a wonderful resemblance to those of the *Grecian*, yet they are too much varied for a mere copy, and the nature of the variation proves them to be original ; nor is the resemblance more extraordinary than that, which has often been observed, between our *Gothic* days of the week and those of the *Hindus*, which are dedicated to the same luminaries, and (what is yet more singular) revolve in the same order :—*Ravi*, the Sun ; *Soma*, the Moon ; *Mangala*, Tuisco ; *Budha*, Woden ; *Vrihaspati*, Thor ; *Sucra*, Freya ; *Sani*, Sater ; yet no man ever imagined that the *Indians* borrowed so remarkable an arrangement from the *Goths* or *Germans*. On the planets I will only observe, that *Sucra*, the regent of *Venus*, is, like all the rest, a *male* deity, named also *Usanas*, and believed to be a sage of infinite learning ; but *Zohrah*, the *Náhíd* of the *Persians*, is a goddess like the *Freya* of our *Saxon* progenitors. The drawing, therefore, of the planets, which was brought into *Bengal* by Mr. *Johnson*, relates to the *Persian* system, and represents the genii supposed to preside over them, exactly as they are described by the poet *Hátifí:* " He bedecked the firmament with stars, and ennobled this earth " with the race of men ; he gently turned the auspicious new moon " of the festival, like a bright jewel, round the ancle of the sky ; " he placed the *Hindu Saturn* on the seat of that restive elephant, " the revolving sphere, and put the rainbow into his hand, as a hook " to coerce the intoxicated beast ; he made silken strings of sun- " beams for the lute of *Venus ;* and presented *Jupiter*, who saw " the felicity of true religion, with a rosary of clustering pleiads. " The bow of the sky became that of *Mars* when he was honoured " with the command of the celestial host ; for *God* conferred sov- " ereignty on the Sun ; and squadrons of stars were his army."

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* See p. 211.

The names and forms of the lunar constellations, especially of *Bharaní* and *Abhijit*, indicate a simplicity of manners peculiar to an ancient people ; and they differ entirely from those of the *Arabian* system, in which the very first asterism appears in the dual number, because it consists only of two stars. *Menzil*, or *the place of alighting* properly signifies a *station* or *stage*, and thence is used for an ordinary day's *journey ;* and that idea seems better applied than *mansion* to so incessant a traveller as the moon ; the *menázilu'l kamar*, or *lunar stages*, of the *Arabs* have *twenty-eight* names, in the following order, the particle *al* being understood before every word :

Sharatàn.
Bútain.
Thurayyà.
Debaràn.
Hakâah.
Hanâah.
7. Dhiráâ.
Nathrah.
Tarf.
Jabhah.
Zubrah.
Sarfah.
Awwà.
14. Simàc.
Ghafr.
Zubáníyah.
Iclìl.
Kalb.
Shaulah.
Naâïm.
21. Beldah.
Dhábih'.
Bulaâ.
Suûd.
Akhbíya.
Mukdim.
Múkhir.
28. Rishà.

Now, if we can trust the *Arabian* lexicographers, the number of stars in their several *menzils* rarely agrees with those of the *Indians ;* and two such nations must naturally have observed, and might naturally have named, the principal stars near which the moon passes in the course of each day, without any communication on the subject. There is no evidence, indeed, of a communication between the *Hindus* and *Arabs* on any subject of literature or science ; for, though we have reason to believe that a commercial intercourse subsisted in very early times between *Yemen* and the western coast of *India*, yet the *Bráhmans*, who alone are permitted to read the six *Védángas*, one of which is the astronomical *Sástra*, were not then commercial, and, most probably, neither could nor would have conversed with *Arabian* merchants. The hostile irruption of the *Arabs* into *Hindustán*, in the eighth century, and that of the *Moguls* under *Chengíz*, in the thirteenth, were not likely to change the astronomical system of the *Hindus ;* but the supposed consequences of *modern* revolutions are out of the question ; for, if any historical records be true, we know with as positive certainty, that *Amarsinh* and *Cálidás* composed their works before the birth of *Christ*, as that *Menander* and *Terence* wrote before that important epoch. Now the twelve *signs* and twenty-seven *mansions* are mentioned, by the several names before exhibited, in a *Sanscrit* vocabulary by the first of those *Indian* authors ; and the second of them frequently alludes to *Róhiní* and the rest by name in his

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Fatal Ring, his *Children of the Sun*, and his *Birth of Cumdra*; from which poem I produce two lines, that my evidence may not seem to be collected from mere conversation :—

Maitrè muhúrtè śaśalánch'hanéna,
Yógam gatásúttarap'halganíshu.

"When the stars of *Uttarap'halgun* had joined in a fortunate hour the fawn-spotted moon."

This testimony being decisive against the conjecture of M. *Montucla*, I need not urge the great antiquity of *Menu's* Institutes, in which the twenty-seven asterisms are called the daughters of *Dacsha* and the consorts of *Sóma*, or the Moon ; nor rely on the testimony of the *Bráhmans*, who asssure me with one voice, that the names of the *Zodiacal* stars occur in the *Védas* ; three of which I firmly believe, from internal and external evidence, to be more than *three thousand* years old. Having therefore proved what I engaged to prove, I will close my essay with a general observation. The result of *Newton's* researches into the history of the primitive sphere was, "that the practice of observing the stars began in *Egypt* "in the days of *Ammon*, and was propagated thence by conquest "in the reign of his son *Sisac*, into *Afric*, *Europe*, and *Asia* ; since "which time *Atlas* formed the sphere of the *Lybians* ; *Chiron*, that "of the *Greeks* ; and the *Chaldeans*, a sphere of their own." Now I hope, on some other occasions, to satisfy the public, as I have perfectly satisfied myself, that "the practice of observing the stars "began, with the rudiments of civil society, in the country of those "whom we call *Chaldeans* ; from which it was propagated into "*Egypt*, *India*, *Greece*, *Italy*, and *Scandinavia*, before the reign of "*Sisac* or *Sácya*, who by conquest spread a new system of religion "and philosophy from the *Nile* to the *Ganges* about a thousand "years before *Christ* ; but that *Chiron* and *Atlas* were allegorical or "mythological personages, and ought to have no place in the serious "history of our species."

XVII.

An Account of the KINGDOM *of* NE'PA'L,

By Father GIUSEPEE,

PREFECT OF THE ROMAN MISSION.

Communicated by JOHN SHORE, *Esq.*

THE kingdom of *Népál* is situated to the north-east of *Patna*, at the distance of ten or eleven days journey from that city. The common road to it lies through the kingdom of *Macwanpur;* but the missionaries and many other persons enter it on the *Bettía* quarter. Within the distance of four days journey from *Népál* the road is good in the plains of *Hiṉdustàn*, but in the mountains it is bad, narrow, and dangerous. At the foot of the hills the country is called *Teriáni;* and there the air is very unwholesome from the middle of *March* to the middle of *November;* and people in their passage catch a disorder, called in the language of that country *Aul*, which is a putrid fever, and of which the generality of people who are attacked with it die in a few days; but on the plains there is no apprehension of it. Although the road be very narrow and inconvenient for three or four days at the passes of the hills, where it is necessary to cross and recross the river more than fifty times, yet, on reaching the interior mountain before you descend, you have an agreeable prospect of the extensive plain of *Népál*, resembling an amphitheatre covered with populous towns and villages: the circumference of the plain is about 200 miles, a little irregular, and surrounded by hills on all sides, so that no person can enter or come out of it without passing the mountains.

There are three principal cities in the plain, each of which was the capital of an independent kingdom; the principal city of the three is situated to the northward of the plain, and is called *Cat'hmándú:* it contains about 18,000 houses; and this kingdom from south to north extends to the distance of twelve or thirteen days journey as far as the borders of *Tibet*, and is almost as extensive from east to west. The king of *Cat'hmándú* has always about fifty thousand soldiers in his service. The second city to the southwest of *Cat'hmándú* is called *Lelit Pattan*, where I resided about four years; it contains near 24,000 houses; the southern boundary of this kingdom is at the distance of four days journey, bordering on the kingdom of *Macwanpur*. The third principal city to the east of *Lelit Pattan* is called *B'hátgán;* it contains about 12,000 families, extends towards the east to the distance of five or six days journey, and borders upon another nation, also independent, called *Cirátas*, who profess no religion. Besides these three principal cities, there are many other large and less considerable towns or fortresses, one of which is *Timi*, and another *Cipoli*, each of which contains about 8,000 houses, and is very populous. All those towns, both great and small, are well built; the houses are constructed of brick, and are three or four stories high; their appartments are not lofty; they have doors and windows of wood, well worked and arranged with great regularity. The streets of all their towns are paved with brick or stone, with a regular declivity to carry off the water. In almost every street of the capital towns there are also good wells made of stone, from which the water passes through several stone-canals for the public benefit. In every town there are large square varandas, well built, for the accommodation of travellers and the public. These varandas are called *Pali;* and there are also many of them, as well as wells, in different parts of the country for public use. There are also, on the outside of the great towns, small square reservoirs of water, faced with brick, with a good road to walk upon, and a large flight of steps for the convenience of those who choose to bathe. A piece of water of this kind on the outside of the city of *Cat'hmándú*, was at least 200 feet long on each side of the square; and every part of its workmanship had a good appearance.

The religion of *Népál* is of two kinds: the more ancient is professed by many people who call themselves *Baryesu:* they pluck out all the hair from their heads; their dress is of course red woollen cloth, and they wear a cap of the same: they are considered as people of the religious order; and their religion prohibits them from marrying, as it is with the *Lamas* of *Tibet*, from which country their religion was originally brought; but in *Népál* they do not observe this rule, except at their discretion. They have large monas-

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teries, in which every one has a separate apartment, or place of abode; they observe also particular festivals, the principal of which is called *Yátrà* in their language, and continues a month or longer, according to the pleasure of the king. The ceremony consists in drawing an idol, which at *Lelit Pattan* is called *Baghero**, in a large and richly ornamented car, covered with gilt copper: round about the idol stand the king and the principal *Baryesus;* and in this manner the vehicle is almost every day drawn through some one of the streets of the city by the inhabitants, who run about beating and playing upon every kind of instrument their country affords, which make an inconceiveable noise.

The other religion, the more common of the two, is that of the *Bráhmens*, and is the same as is followed in *Hindustàn*, with the difference that in the latter country, the *Hindus* being mixed with the *Mohammedans*, their religion also abounds with many prejudices, and is not strictly observed; whereas in *Népál*, where there are no *Muselmans* (except one *Cashmirian* merchant) the *Hindu* religion is practised in its greatest purity. Every day of the month they class under its proper name, when certain sacrifices are to be performed and certain prayers offered up in their temples. The places of worship are more in number in their towns than, I believe, are to be found in the most populous and most flourishing cities of *Christendom;* many of them are magnificient according to their ideas of architecture, and constructed at a very considerable expence; some of them have four or five square cupolas; and in some of the temples two or three of the extreme cupolas, as well as the doors and windows of them, are decorated with gilt copper.

In the city of *Lelit Pattan* the temple of *Baghero* was contiguous to my habitation, and was more valuable, on account of the gold, silver, and jewels it contained, than even the house of the king. Besides the large temples, there are also many small ones, which have stairs, by which a single person may ascend on the outside all around them; and some of those small temples have four sides, other six, with small stone or marble pillars, polished very smooth, with two or three pyramidal stories, and all their ornaments well gilt and neatly worked, according to their ideas of taste: and I think, that, if *Europeans* should ever go into *Népál*, they might take some models from those little temples, especially from the two which are in the great court of *Lelit Pattan*, before the royal palace. On the outside of some of their temples there are also great square pillars of single stones, from twenty to thirty feet high, upon which they place their idols, superbly gilt. The greatest number of their temples have a good stone staircase in the middle of the four squares, and at the end of each flight of stairs there are lines cut out of stone on both sides. Round about their temples there are also bells, which the people ring on particular occasions; and when they are at prayers, many cupolas are also quite filled with little bells, hanging by cords in the inside, about the distance of a foot from each other, which make a great noise on that quarter where the wind conveys the sound. There are not only superb temples in their great cities, but also within their castles.

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* I suppose a name of *Bhagvat* or *Crishna;* but *Bhárga* is *Mahadéva*, and *Bajri* or *Vajri* means the *Thunderer*.

To the eastward of *Cat'hmándú*, at the distance of two or three miles, there is a place called *Tolu*, by which there flows a small river, the water of which is esteemed holy, according to their superstitious ideas; and thither they carry people of high rank, when they are thought to be at the point of death. At this place there is a temple, which is not inferior to the best and richest in any of the capital cities. They also have it on tradition, that, at two or three places in *Népál*, valuable treasures are concealed under ground. One of those places they believe is *Tolu;* but no one is permitted to make use of them except the king, and that only in cases of necessity. Those treasures, they say, have been accumulated in this manner: When any temple had become very rich from the offerings of the people, it was destroyed, and deep vaults dug under ground, one above another, in which the gold, silver, gilt copper, jewels, and every thing of value were deposited. When I was in *Népál*, *Gainprejas*, king of *Cat'hmándú*, being in the utmost distress for money to pay his troops, in order to support himself against *Prit'hwínáráyan*, ordered search to be made for the treasures of *Tolu;* and, having dug to a considerable depth under ground, they came to the first vault; from which his people took to the value of a lac of rupees in gilt copper, with which *Gainprejas* paid his troops, exclusive of a number of small figures in gold, or gilt

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copper, which the people who had made the search had privately carried off ; and this I know very well ; because one evening as I was walking in the country alone, a poor man, whom I met on the road, made me an offer of a figure of an idol in gold, or copper gilt, which might be five or six sicca weight, and which he cautiously preserved under his arm ; but I declined accepting it. The people of *Gainprejas* had not completely emptied the first vault, when the army of *Prit'hwínárdyan* arrived at *Tolu*, possessed themselves of the place where the treasure was deposited, and closed the door of the vault, having first replaced all the copper there had been on the outside.

To the westward also of the great city of *Lelit Pattan*, at the distance of only three miles, is a castle called *Banga*, in which there is a magnificent temple. No one of the missionaries ever entered into this castle, because the people who have the care of it have such a scrupulous veneration for this temple, that no person is permitted to enter it with his shoes on ; and the missionaries, unwilling to shew such respect to their false deities, never entered it. But when I was at *Népál*, this castle being in the possession of the people of *Górc'há*, the Commandant of the castle and of the two forts which border on the road, being a friend of the missionaries, gave me an invitation to his house, as he had occasion for a little physic for himself and some of his people : I then, under the protection of the Commandant, entered the castle several times, and the people durst not oblige me to take off my shoes. One day, when I was at the Commandant's house, he had occasion to go into the varanda, which is at the bottom of the great court facing the temple, where all the chiefs dependent upon his orders were assembled, and where also was collected the wealth of the temple ; and, wishing to speak to me before I went away, he called me into the varanda. From this incident I obtained a sight of the temple, and then passed by the great court which was in front : it is entirely marble almost blue, but interspersed with large flowers of bronze well disposed, to form the pavement of the great court-yard, the magnificence of which astonished me ; and I do not believe there is another equal to it in *Europe*.

Besides the magnificence of the temples, which their cities and towns contain, there are many other rarities. At *Cat'hmándú*, on one side of the royal garden, there is a large fountain, in which is one of their idols, called *Nárâyan*. This idol is of blue stone, crowned and sleeping on a mattress of the same kind of stone; and the idol and the mattress appear as floating upon the water. This stone machine is very large: I believe it to be eighteen or twenty feet long, and broad in proportion; but well worked, and in good repair.

In a wall of the royal palace of *Cat'hmándú*, which is built upon the court before the palace, there is a great stone of a single piece, which is about fifteen feet long, and four or five feet thick: on the top of this great stone there are four square holes at equal distances from each other. In the inside of the wall they pour water into the holes, and in the courtside, each hole having a closed canal, every person may draw water to drink. At the foot of the stone is a large ladder, by which people ascend to drink; but the curiosity of the stone consists in its being quite covered with characters of different languages cut upon it. Some lines contain the characters of the language of the country; others the characters of *Tibet*, others *Persian*, others *Greek*, besides several others of different nations; and in the middle there is a line of *Roman* characters, which appears in this form AVTOMNEW INTER LHIVERT; but none of the inhabitants have any knowledge how they came there, nor do they know whether or not any *European* had ever been in *Népál* before the missionaries, who arrived there only the beginning of the present century. They are manifestly two *French* names of seasons, with an *English* word between them.

There is also to the northward of the city of *Cat'hmándú* a hill called *Simbi*, upon which are some tombs of the *Lamas* of *Tibet*, and other people of high rank of the same nation. The monuments are constructed after various forms; two or three of them are pyramidal, very high and well ornamented; so that they have a very good appearance, and may be seen at a considerable distance. Round these monuments are remarkable stones covered with characters, which probably are the inscriptions of some of the inhabitants of *Tibet*, whose bones were interred there. The natives of *Népál* not only look upon the hill as sacred, but imagine it is protected by their idols; and, from this erroneous supposition, never thought of stationing troops there for the defence of it, although it be a post of great importance, and only at a short mile's distance from the city: but during the time of hostilities a party of *Prit'hwinárdyan's* troops being pursued by those of *Gainprejas*, the former, to save themselves, fled to this hill, and, apprehending no danger from its guardian idols, they possessed themselves of it, and erected a fortification (in their own style) to defend themselves. In digging the ditches round the fort, which were adjoining to the tombs, they found considerable pieces of gold, with a quantity of which metal the corpses of the grandees of *Tibet* are always interred; and when the war was ended, I myself went to see the monuments upon the hills.

I believe that the kingdom of *Népál* is very ancient, because it has always preserved its peculiar language and independence; but the cause of its ruin is the dissention which subsists among the three kings. After the death of their sovereign, the nobles of *Lelit Pattan* nominated for their king *Gainprejas*, a man possessed of the greatest influence in *Népál;* but some years afterwards they removed him from his government, and conferred it upon the king of *Bhatgán;* but he also a short time afterwards was deposed; and, after having put to death another king who succeeded him, they made an offer of the government to *Prit'hwinárdyan*, who had already commenced war. *Prit'hwinárdyan* deputed one of his brothers, by name *Delmerden Sáh*, to govern the kingdom of *Lelit Pattan*, and he was in the actual government of it when I arrived at *Népál;* but the nobles perceiving that *Prit'hwinárdyan* still continued to interrupt the tranquility of the kingdom, they disclaimed all subjection to him, and acknowledged for their sovereign *Delmerden Sáh*, who continued the war against his brother *Prit'hwinárdyan:* but some years afterwards they even deposed *Delmerden Sáh*, and elected in his room a poor man of *Lelit Pattan*, who was of royal origin.

The king of *Bhatgán*, in order to wage war with the other kings of *Népál*, had demanded assistance from *Prit'hwinárdyan;* but seeing that *Prit'hwinárdyan* was possessing himself of the country, he was obliged to desist, and to take measures for the defence of his own possessions; so that the king of *Górc'ha'* although he had been formerly a subject of *Gainprejas*, taking advantage of the dissentions which prevailed among the other kings of *Népál*, attached to his party many mountain-chiefs, promising to keep them in possession, and also to augment their authority and importance; and if any of them were guilty of a breach of faith, he seized their country as he had done to the kings of *Marecajis*, although his relations.

The king of *Górc'hà* having already possessed himself of all the mountains which surround the plain of *Népál*, began to descend into the flat country, imagining he should be able to carry on his operations with the same facility and success as had attended him on the hills; and, having drawn up his army before a town, containing about 8000 houses, situate upon a hill called *Círtipur*, about a league's distance from *Cat'hmándú*, employed his utmost endeavours to get possession of it. The inhabitants of *Círtipur* receiving no support from the king of *Lelit Pattan*, to whom they were subject, applied for assistance to *Gainprejas*, who immediately marched with his whole army to their relief, gave battle to the army of the king of *Górc'hà*, and obtained a complete victory. A brother of the king of *Górc'hà* was killed on the field of battle; and the king himself, by the assistance of good bearers, narrowly escaped with his life by fleeing into the mountains. After the action, the inhabitants of *Círtipur* demanded *Gainprejas* for their king, and the nobles of the town went to confer with him on the business, but, being all assembled in the same apartment with the king, they were all surprised and seized by his people. After the seizure of those persons, *Gainprejas*, perhaps to revenge himself of these nobles for having refused their concurrence to his nomination as king, privately caused some of them to be put to death; another, by name *Danuvanta*, was led through the city in a woman's dress, along with several others, clothed in a ridiculous and whimsical manner, at the expense of the nobles of *Lelit Pattan*. They were then kept in close confinement for a long time. At last, after making certain promises, and interesting all the principal men of the country in their behalf, *Gainprejas* set them at liberty.

The king of *Górc'hà*, despairing of his ability to get possession of the plain of *Népál* by strength, hoped to effect his purpose by causing a famine, and with this design, stationed troops at all the passes of the mountains to prevent any intercourse with *Népál*; and his orders were most rigorously obeyed, for every person who was found in the road, with only a little salt or cotton about him, was hung upon a tree; and he caused all the inhabitants of a neigh-

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bouring village to be put to death in a most cruel manner (even the women and children did not escape) for having supplied a little cotton to the inhabitants of *Népál ;* and, when I arrived in that country at the beginning of 1769, it was a most horrid spectacle to behold so many people hanging on trees in the road. However the king of *Górc'hà* being also disappointed in his expectations of gaining his end by this project, fomented dissentions among the nobles of the three kingdoms of *Népál*, and attached to his party many of the principal ones, by holding forth to them liberal and enticing promises ; for which purpose he had about 2000 *Bráhmens* in his service. When he thought he had acquired a party sufficiently strong, he advanced a second time with his army to *Círtipur*, and laid siege to it on the north-west quarter, that he might avoid exposing his army between the two cities of *Cat'h-mándú* and *Lelit Pattan.* After a siege of several months, the king of *Górc'hà* demanded the regency of the town of *Círtipur*, when the commandant of the town, seconded by the approbation of the inhabitants, dispatched to him by an arrow a very impertinent and exasperating answer. The king of *Górc'hà* was so much enraged at this mode of proceeding, that he gave immediate orders to all his troops to storm the town on every side : but the inhabitants bravely defended it, so that all the efforts of his men availed him nothing ; and, when he saw that his army had failed of gaining the precipice, and that his brother named *Surú'paratna* had fallen wounded by an arrow, he was obliged to raise the siege a second time, and to retreat with his army from *Círtipur.* The brother of the king was afterwards cured of his wound by our father *Michael Angelo*, who is at present in *Bettía.*

After the action, the king of *Górc'ha'* sent his army against the king of *Lamji* (one of the twenty-four kings who reign to the west-ward of *Népál*) bordering upon his own kingdom of *Górc'ha'*. After many desperate engagements, an accomodation took place with the king of *Lamji :* and the king of *Górc'ha'* collecting all his forces, sent them for the third time to besiege *Círtipur ;* and the army on this expedition was commanded by his brother *Surúparatna.* The inhabitants of *Círtipur* defended themselves with their usual bravery, and, after a siege of several months, the three kings of *Népál* assembled at *Cat'hmándú* to march a body of troops to the relief of *Cirtipur*. One day in the afternoon they attack some of the *Tanas* of the *Górc'hians*, but did not succeed on forcing them, because the king of *Górc'há's* party had been reinforced by many of the nobility, who, to ruin *Gainprejas*, were willing to sacrifice their own lives. The inhabitants of *Cirtipur* having already sustained six or seven months siege, a noble of *Lelit Pattan* called *Danuvanta* fled to the *Górc'há* party, and treacherously introduced their army into the town. The inhabitants might still have defended themselves, having many other fortresses in the upper parts of the town to retreat to; but the people at *Górc'há* having published a general amnesty, the inhabitants, greatly exhausted by the fatigues of a long siege, surrendered themselves prisoners upon the faith of that promise. In the mean time the men of *Górc'há* seized all the gates and fortresses within the town; but two days afterwards *Prit'hwinárdyan*, who was at *Navacúta* (a long day's journey distant) issued an order to *Surúparatna* his brother, to put to death some of the principal inhabitants of the town, and to cut off the noses and lips of every one, even the infants, who were not found in the arms of their mothers; ordering at the same time all the noses and lips, which had been cut off, to be preserved, that he might ascertain how many souls there were, and to change the name of the town into *Naskatápur*, which signifies *the town of cut noses*. The order was carried into execution with every mark of horror and cruelty, none escaping but those who could play on wind instruments; although father *Michael Angelo*, who, without knowing that such an inhuman scene was then exhibited, had gone to the house of *Surúparatna*, and interceded much in favour of the poor inhabitants. Many of them put an end to their lives in despair; others came in great bodies to us in search of medicines; and it was most shocking to see so many living people with their teeth and noses resembling the skulls of the deceased.

After the capture of *Cirtipur*, *Prit'hwinárdyan* dispatched immediately his army to lay siege to the great city of *Lelit Pattan*. The *Go'rc'hians* surrounded half the city to the westward with their *Tanas*; and, my house being situated near the gate of that quarter, I was obliged to retire to *Cat'hmándu'*, to avoid being exposed to the fire of the besiegers. After many engagements between the inhabitants of the town of *Lelit Pattan*, and the men of *Go'rc'há*, in which much blood was spilt on both sides, the former were disposed to surrender themselves, from the fear of having their noses cut off, like those at *Círtipur*, and also their right hands, a barbarity the *Górc'hians* had threatened them with, unless they would surrender within five days. One night all the *Górc'hians* quitted the siege of *Lelit Pattan* to pursue the *English* army, which, under the command of Captain *Kinloch*, had already taken *Sidu'li*, an important fort at the foot of the *Népál* hills, which border upon the kingdom of *Tirhùt:* but Captain *Kinloch* not being able to penetrate the hills, either on the *Sidu'li* quarter or by the pass at *Hareapur*, in the kingdom of *Macwanpur*, the army of *Go'rc'hà* returned to *Népál* to direct their operations against the city of *Cat'hmándu'*, where *Gainprejas* was, who had applied for succour to the *English.* During the siege of *Cat'hmándu'* the *Bráhmens* of *Go'rc'hà* came almost every night into the city, to engage the chiefs of the people on the part of their king, and the more effectually to impose upon poor *Gainprejas*, many of the principal *Bráhmens* went to his house, and told him to persevere with confidence that the chiefs of the *Go'rc'hà* army were attached to his cause, and that even they themselves would deliver up their king *Prit'hwinárâyan* to his hands. Having by these artifices procured an opportunity of detaching from his party all his principal subjects, tempting them with liberal promises according to their custom, one night the men of *Go'rc'hà* entered the city without opposition, and the wretched *Gainprejas*, perceiving he was betrayed, had scarce time to escape with about three hundred of his best and most faithful *Hindustáni* troops towards *Lelit Pattan;* which place however he reached the same night.

The king of *Go'rc'hà* having made himself master of *Cat'hmándú* in the year 1768, persisted in the attempt of possessing himself also of the city of *Lelit Pattan*, promising all the nobles that he would suffer them to remain in the possession of their property, that he would even augment it; and because the nobles of *Lelit Pattan* placed a reliance on the faith of his promises, he sent his domestic priest to make this protestation; that, if he failed to acquit himself of his promise, he should draw curses upon himself and his family even to the fifth past and succeeding generation, so that the unhappy *Gainprejas* and the king of *Lelit Pattan*, seeing that the nobility were disposed to render themselves subject to the king of

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Go'rc'ha', withdraw themselves with their people to the king of *B'hatgán.* When the city of *Lelit Pattan* became subject to the king of *Go'rc'ha'*, he continued for some time to treat the nobility with great attention, and proposed to appoint a viceroy of the city from among them. Two or three months afterwards, having appointed the day for making his formal entrance into the city of *Lelit Pattan*, he made use of innumerable stratagems to get into his possession the persons of the nobility, and in the end succeeded. He had prevailed upon them to permit their sons to remain at court as companions of his son ; he had dispatched a noble of each house to *Navacút*, or *New Fort*, pretending that the apprehensions he entertained of them had prevented his making a public entrance into the city ; and the remaining nobles were seized at the river without the town, where they went to meet him agreeably to a prior engagement. Afterwards he entered the city, made a visit to the temple of *Baghero* adjoining to our habitation, and passing in triumph through the city amidst immense numbers of soldiers who composed his train, entered the royal palace which had been prepared for his reception ; in the mean time parties of his soldiers broke open the houses of the nobility, seized all their effects, and threw the inhabitants of the city into the utmost consternation. After having caused all the nobles who were in his power to be put to death, or rather their bodies to be mangled in a horrid manner, he departed with a design of besieging *B'hatgan ;* and we obtained permission, through the interest of his son, to retire with all the *Christians* into the possessions of the *English.*

At the commencement of the year 1769, the king of *Go'rc'hà* acquired possession of the city of *B'hatgán*, by the same expedients to which he owed his former successes ; and on his entrance with his troops into the city, *Gainprejas*, seeing he had no resource left to save himself, ran courageously with his attendants towards the king of *Go'rc'ha'*, and, at a small distance from his palanquin, received a wound in his foot, which a few days afterwards occasioned his death. The king of *Lelit Pattan* was confined in irons till his death, and the king of *B'hatgán*, being very far advanced in years, obtained leave to go and die at *Benares*. A short time afterwards the mother of *Gainprejas* also procured the same indulgence, having from old age already lost her eye-sight ; but before her departure they took from her a necklace of jewels (as she herself told me) when she arrived at *Patna* with the widow of her grandson: and I could not refrain from tears, when I beheld the misery and disgrace of this blind and unhappy queen.

The king of *Go'rc'ha'*, having thus in the space of four years effected the conquest of *Népál*, made himself master also of the country of the *Cirátas* to the east of it, and of other kingdoms, as far as the borders of *Co'ch Bihár.* After his decease, his eldest son *Pratáp Sinh* held the government of the whole country: but scarcely two years after, on *Pratáp Sinh's* death, a younger brother, by name *Bahádar Sáh*, who resided then at *Bettía* with his uncle *Delmerden Sáh*, was invited to accept of the government: and the beginning of his government was marked with many massacres. The royal family is in the greatest confusion, because the queen lays claim to the government in the name of her son, whom she had by *Pratáp Sinh;* and perhaps the oath violated by *Prit'hwínárayan* will in the progress of time have its effect. Such have been the successors of the kingdoms of *Népál*, of which *Prit'hwínárayan* had thus acquired possession.

XVIII.

On the CURE *of* PERSONS BITTEN *by* SNAKES.

By JOHN WILLIAMS, *Esq.*

THE following statement of facts relative to the cure of persons bitten by snakes, selected from a number of cases which have come within my own knowledge, require no prefatory introduction, as it points out the means of obtaining the greatest self-gratification the human mind is capable of experiencing, That of the preservation of the life of a fellow-creature, and snatching him from the jaws of death, by a method which every person is capable of availing himself of. Eau de Luce, I learn from many communications which I have received from different parts of the country, answers as well as the pure Caustic Alkali Spirit ; and though, from its having some essential oils in its composition, it may not be so powerful, yet, as it must be given with water, it only requires to encrease the dose in proportion ; and, so long as it retains its milky white colour, it is sufficiently efficacious.

From the effect of a ligature applied between the part bitten and the heart, it is evident that the poison diffuses itself over the body by the returning venous, blood ; destroying the irritability, and rendering the system paralytic. It is therefore probable that the Volatile Caustic Alkali, in resisting the disease of the poison, does not act so much as a specific in destroying its quality, as by counteracting the effect on the system, by stimulating the fibres, and preserving that irritability which it tends to destroy.

CASE I.

In the month of *August* 1780, a servant of mine was bitten in the heel, as he supposed, by a snake ; and in a few minutes was in great agony, with convulsions about the throat and jaws, and continual grinding of the teeth. Having a wish to try the effects of Volatile Alkali in such cases, I gave him about forty drops of

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Eau de Luce in water, and applied some of it to the part bitten. The dose was repeated every eight or ten minutes, till a small phialful was expended : it was near two hours before it could be said he was out of danger. A numbness and pricking sensation was perceived extending itself up to the knee, where a ligature was applied so tight, as to stop the returning venous blood, which seemingly checked the progress of the deleterious poison. The foot and leg, up to where the ligature was made, were stiff and painful for several days ; and, which appeared very singular, were covered with a branny scale.

The above was the first case in which I tried the effects of the Volatile Alkali, and, apprehending that the essential oils in the composition of Eau de Luce, though made of the strong Caustic Volatile Spirit, would considerably diminish its powers, I was induced, the next opportunity that offered, to try the effects of pure Volatile Caustic Alkali Spirit, and accordingly prepared some from Quicklime and the Sal Ammoniac of this country.

CASE II.

In *July* 1782, a woman of the *Bráhmen* cast, who lived in my neighbourhood at *Chunár*, was bitten by a *Cobra de Capello* between the thumb and fore-finger of her right hand. Prayers and superstitious incantations were practised by the *Bráhmens* about her, till she became speechless and convulsed, with locked jaws, and a profuse discharge of saliva running from her mouth. On being informed of the accident, I immediately sent a servant with a bottle of the Volatile Caustic Alkali Spirit, of which he poured about a tea-spoonful, mixed with water, down her throat, and applied some of it to the part bitten. The dose was repeated a few minutes after; when she was evidently better, and in about half an hour was perfectly recovered.

This accident happened in a small hut, where I saw the snake, which was a middle-sized *Cobra de Capello*. The *Bráhmens* would not allow it to be killed. In the above case, no other means whatever were used for the recovery of the patient than are here recited.

CASE III.

A woman-servant in the family of a gentleman at *Benares*, was bitten in the foot by a *Cobra de Capello*. The gentleman immediately applied to me for some of the Volatile Caustic Alkali, which I fortunately had by me. I gave her about sixty drops in water, and also applied some of it to the part bitten. In about seven or eight minutes after, she was quite recovered. In the above case, I was not witness to the deleterious effect of the poison on the patient; but saw the snake after it was killed.

CASE IV.

In *July* 1784, the wife of a servant of mine was bitten by a *Cobra de Capello* on the out-side of the little toe of her right foot. In a few minutes she became convulsed, particularly about the jaws and throat, with a continued gnashing of the teeth. She at first complained of a numbness extending from the wound upwards; but no ligature was applied to the limb. About sixty drops of the Volatile Caustic Spirit were given to her in water, by forcing open her mouth, which was strongly convulsed: in about seven minutes the dose was repeated, when the convulsions left her; and in three more she became sensible, and spoke to those who attended her. A few drops of the spirit had also been applied to the wound. The snake was killed and brought to me, which proved to be a *Cobra de Capello.*

CASE V.

As it is generally believed that the venom of snakes is more malignant during hot dry weather than at any other season, the following case, which occurred in the month of *July* 1788, when the weather was extremely hot, no rain, excepting a slight shower, having fallen for many months, may not be unworthy of notice:—

A servant belonging to an Officer at *Juanpoor*, was bitten by snake on the leg, about two inches above the outer ankle. As the accident happened in the evening, he could not see what species of snake it was. He immediately tied a ligature above the part bitten, but was in a few minutes in such exquisite torture from pain, which extended up his body and to his head, that he soon became dizzy and senseless. On being informed of the accident, I sent my servant with a phial of the Volatile Caustic Alkali, who found him, when he arrived, quite torpid, with the saliva running out of his mouth, and his jaws so fast locked, as to render it necessary to use an instrument to open them, and administer the medicine. About

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forty drops of the Volatile Caustic Spirit were given to him in water, and applied to the wound ; and the same dose repeated a few minutes after. In about half an hour he was perfectly recovered. On examining the part bitten, I could discover the marks of three fangs ; two on one side, and one on the other ; and, from the distance they were asunder, I should judge it a large snake. More than ten minutes did not appear to have elapsed from the time of his being bitten till the medicine was administered. The wounds healed immediately, and he was able to attend to his duty the next day. Though the species of snake was not ascertained, yet I judge from the flow of saliva from the mouth. convulsive spasms of the jaws and throat, as well as from the marks of three fangs, that it must have been a *Cobra de Capello ;* and, though I have met with five and six fangs of different sizes in snakes of that species, I never observed the marks of more than two having been applied in biting in any other case which came within my knowledge.

CASE VI.

In *September* 1786, a servant belonging to Captain S——, who was then at *Benares*, was bitten in the leg by a large *Cobra de Capello.* He saw the snake coming towards him, with his neck spread out in a very tremendous manner, and endeavoured to avoid him ; but, before he could get out of his way, the snake seized him by the leg, and secured his hold for some time, as if he had not been able to extricate his teeth. Application was immediately made to his master for a remedy, who sent to consult me ; but, before I arrived, had given him a quantity of sweet oil, which he drank. So soon as I saw him, I directed the usual dose of Volatile Caustic Alkali to be given, which fortunately brought away the oil from his stomach, or it is probable that the stimulating effect of the Volatile Spirit would have been so much blunted by it, as to have become inefficacious : a sacond dose was immediately administered, and some time after, a third. The man recovered in the course of a few hours. As oil is frequently administered as a remedy in the bite of snakes, I think it necessary to caution against the use of it with the Volatile Alkali, as it blunts the stimulating quality of the spirit and renders it useless.

Of the numerous species of snakes which I have met with, not above six were provided with poisonous fangs ; though I have examined many which have been considered by the natives as dangerous, without being able to discover any thing noxious in them.

The following is an instance of the deleterious effect of the bite of a snake, called by the natives *Krait*, a species of the *Boa*, which I have frequently met with in this part of the country :—

CASE VII.

On the 16th *September* 1788, a man was brought to me who had been bitten by snake, with the marks of two fangs on two of his toes ; he was said to have been bitten above an hour before I saw him : he was perfectly sensible, but complained of great pain in the parts bitten, with an unusual languor. I immediately gave him thirty drops of the Volatile Caustic Alkali Spirit in water, and applied some of it to the wounds. In a few minutes he became easier, and in about half an hour was carried away by his friends, with perfect confidence in his recovery, without having taken a second dose of the medicine, which indeed did not appear to have been necessary ; but, whether from the effect of the bite of the snake, or the motion of the dooly on which he was carried, I know not ; but he became sick at the stomach, threw up the medicine, and died in about a quarter of an hour after. The man said that the snake came up to him while he was sitting on the ground ; and that he put him away with his hand once, but that he turned about and bit him, as described. The snake was brought to me which I examined : it was about two feet and a half long, of a lightish brown colour on the back, a white belly, and annulated from end to end, with 208 abdominal, and forty-six tail scuta. I have met with several of them from thirteen inches to near three feet in length : it had two poisonous fangs in the upper jaw, which lay naked, with their points without the upper lip. It does not spread its neck, like the *Cobra de Capello*, when enraged ; but is very active and quick in its motion.

I have seen instances of persons bitten by snakes, who have been so long without assistance, that, when they have been brought to me, they have not been able to swallow, from convulsions of the throat and fauces, which is, I observe, a constant symptom of the bite of the *Cobra de Capello:* and indeed I have had many persons brought to me who had been dead some time ; but never knew an instance of the Volatile Caustic Alkali failing in its effect, where the patient has been able to swallow it.

XIX.

On some ROMAN COINS *found at* NELORE.

To the PRESIDENT *of the* ASIATIC SOCIETY.

SIR,

I HAVE the honour to present you with an extract of a letter from Mr. *Alexander Davidson*, late Governor of *Madras*, giving an account of some *Roman Coins* and *Medals* lately found near *Nelore*, together with a drawing of them copied from one transmitted by Mr. *Davidson*; which, I imagine, may be acceptable to the *Asiatic* Society.

I have the honour to be,

Sir,
Your most obedient humble servant,

S. DAVIS.

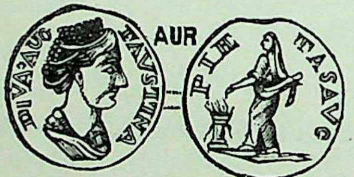
Calcutta, March 20, 1788.

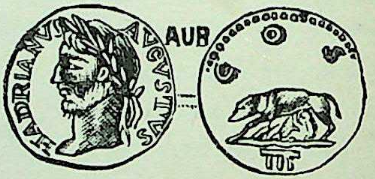
EXTRACT *of a Letter from* ALEXANDER DAVIDSON, *Esq.*

Dated Madras, July 12, 1787.

A PEASANT near *Nelór*, about 100 miles north-west of *Madras*, was ploughing on the side of a stony craggy hill: his plough was obstructed by some brick-work: he dug, and discovered the remains of a small *Hindu* temple, under which a little pot was found with *Roman* Coins and Medals of the second century.

He sold them as old gold; and many no doubt were melted, but the *Nawáb Amírul Umará* recovered upwards of thirty of them. This happened while I was Governor; and I had the choice of two out of the whole. I chose an *Adrian* and *Faustina*.





Some of the *Trajans* were in good preservation. Many of the Coins could not have been in circulation: they were all of the purest gold, and many of them as fresh and beautiful as if they had come from the mint but yesterday. Some were much defaced and perforated, and had probably been worn as ornaments on the arm, and others pending from the neck.

I send you drawings of my two coins, and have no objection to your publishing an account of them in the Transactions of the *Asiatic* Society. I received my information respecting them from the young *Nawáb*; and if my name be necessary to authenticate the facts I have related, you have my permission to use it.

XX.

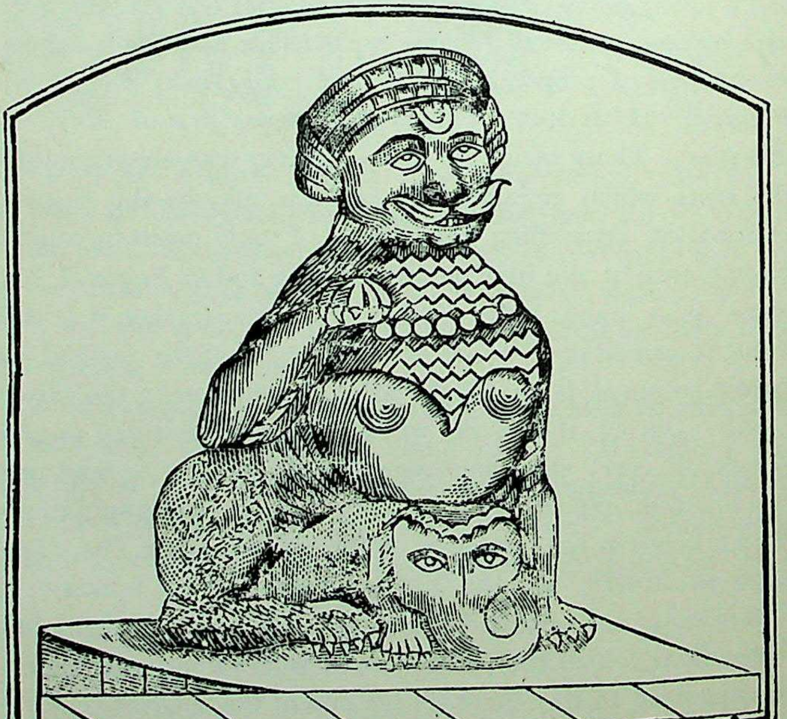
On TWO HINDU FESTIVALS, *and the* INDIAN SPHINX.

By the late Colonel PEARSE, *May* 12, 1785.

I BEG leave to point out to the Society, that the *Sunday* before last was the festival of *Bhavánì*, which is annually celebrated by the *Gópas*, and all other *Hindus* who keep horned cattle for use or profit. On this feast they visit gardens, erect a pole in the fields, and adorn it with pendants and garlands. The *Sunday* before last was our *first* of *May*, on which the same rites are performed by the same class of people in *England*, where it is well known to be a relique of ancient superstition in that country: it should seem, therefore, that the religion of the east and the old religion of *Britain* had a strong affinity. *Bhavánì* has another festival; but that is not kept by any one set of *Hindus* in particular, and this is appropriated to one class of people. This is constantly held on the *ninth* of *Baisác'h;* which does not always fall on our *first* of *May*, as it did this year. Those members of the Society who are acquainted with the rules which regulate the festivals, may be able to give better information concerning this point. I only mean to point out the resemblance of the rites performed here and in *England*, but must leave abler hands to investigate the matter further, if it should be thought deserving of the trouble. I find that the festival which I have mentioned, is one of the most ancient among the *Hindus*.

II. During the *Húlì*, when mirth and festivity reign among *Hindus* of every class, one subject of diversion is to send people on errands and expeditions, that are to end in disappointment, and raise a laugh at the expense of the person sent. The *Húlì* is always in *March*, and the last day is the greatest holiday. All the *Hindus* who are on that day at *Jagannát'h*, are entitled to certain distinctions, which they hold to be of such importance, that I found it expedient to stay there till the end of the festival; and I am of opinion, and so are the rest of the officers, that I saved above five hundred men by the delay. The origin of the *Húlì* seems lost in antiquity ; and I have not been able to pick up the smallest account of it.

If the rites of *May-day* show any affinity between the religion of *England* in times past and that of the *Hindus* in these times, may not the custom of making *April-fools*, on the first of that month, indicate some traces of the *Húlì ?* I have never yet heard any account of the origin of the *English* custom ; but it is unquestionably very ancient, and is still kept up even in great towns, though less in them than in the country. With us it is chiefly confined to the lower classes of people ; but in *India* high and low join in it ; and the late *Shujául Daulah*, I am told, was very fond of making *Húlì*-fools, though he was a *Muselman* of the highest rank. They carry it here so far, as to send letters making appointments in the names of persons who, it is known, must be absent from their house at the time fixed on ; and the laugh is always in proportion to the trouble given.



III. At *Jagannát'h* I found the *Sphinx* of the *Egyptians*, and present the Society with a drawing of it. *Murári Pandit*, who was deputy *Faujdàr* of *Balasór*, attended my detachment on the part of the *Mahráttas.* He is now the principal *Faujdàr*, and is much of the gentleman : a man of learning, and very intelligent. From him I learned that the *Sphinx*, here called *Singh*, is to appear at the end of the world, and, as soon as he is born, will prey on an elephant. He is, therefore, figured seizing an elephant in his claws, and the elephant is made small, to show that the *Singh*, even a moment after his birth, will be very large in proportion to it.

When I told *Murári* that the *Egyptians* worshipped the bull and chose the God by black mark on his tongue, and that they adored birds and trees, he immediately exclaimed: "their religion then "was the same with ours ; for we also choose our *sacred bulls* by the "*same marks ;* we reverence the *hansa*, the *garura*, and other birds ; "we respect the *pippal* and the *vata* among trees, and the *tulasì* "among shrubs ; but as for onions (which I had mentioned) they "are eaten by low men, and are fitter to be eaten than worshipped."

REMARK BY THE PRESIDENT.

Without presuming to question the authority of *Murári Pandit*, I can only say, that several *Bráhmans* now in *Bengal*, have seen the figure at *Jogannát'h*, where one of the gates is called *Sińhadwár ;* and they assure me, that they always considered it as a mere representation of a *Lion* seizing a young elephant ; nor do they know, they say, any sense for the word *Sińha*, but a *Lion*, such as Mr. *Hastings* kept near his garden. The *Húlì*, called *Hólácà* in the *Védas*, and *P'halgútsava* in common *Sanscrit* books, is the festival of the vernal season, *Naurúz* of the *Persians*.

XXI.

A short DESCRIPTION *of* CARNICOBAR, *by Mr.* G. HAMILTON.

Communicated by Mr. ZOFFANY.

THE island, of which I propose to give a succinct account, is the northernmost of that cluster in the *Bay of Bengal*, which goes by the name of the *Nicobars*. It is low, of a round figure, about forty miles in circumference, and appears at a distance as if entirely covered with trees: however, there are several well-cleared and delightful sports upon it. The soil is a black kind of clay, and marshy. It produces in great abundance, and with little care, most of the tropical fruits, such as pine-apples, plantains, papayas, cocoa-nuts, and areca-nuts; also excellent yams, and a root called *cachu*. The only four-footed animals upon the island are hogs, dogs, large rats, and an animal of the lizard kind, but large, called by the natives *tolonqui*; these frequently carry off fowls and chickens. The only kind of poultry are hens, and those not in great plenty. There are abundance of snakes, of many different kinds; and the inhabitants frequently die of their bites. The timber upon the island is of many sorts, in great plenty, and some of it remarkably large, affording excellent materials for building or repairing ships.

The natives are low in stature, but very well made, and surprizingly active and strong; they are copper-coloured, and their features have a cast of the *Malay*; quite the reverse of elegant. The women, in particular, are extremely ugly. The men cut their hair short, and the women have their heads shaved quite bare, and wear no covering but a short petticoat, made of a sort of rush or dry grass, which reaches half way down the thigh. This grass is not interwoven, but hangs round the person something like the thatching of a house. Such of them as have received presents of cloth-petticoats from the ships, commonly tie them round immediately under the arms. The men wear nothing but a narrow strip of cloth about the middle, in which they wrap up their privities so tight, that there hardly is any appearance of them. The ears of both sexes are pierced when young, and by squeezing into the holes large plugs of wood, or hanging heavy weights of shells, they contrive to render them wide, and disagreeable to look at. They are naturally disposed to be good humoured and gay, and are very fond of sitting at table with *Europeans*, where they eat every thing that is set before them; and they eat most enormously. They do not care much for wine, but will drink bumpers of arrack as long as they can see. A great part of their time is spent in feasting and dancing. When a feast is held at any village, every one that chooses goes uninvited, for they are utter strangers to ceremony. At those feasts they eat immense quantities of pork, which is their favourite food. Their hogs are remarkably fat, being fed upon the cocoa-nut kernel and sea-water: indeed all their domestic animals, fowls, dogs, &c. are fed upon the same. They have likewise plenty of small sea-fish which they strike very dexterously with lances, wading into the sea about knee deep. They are sure of killing a very small fish at ten or twelve yards distance. They eat the pork almost raw, giving it only a hasty grill over a quick fire. They roast a fowl, by running a piece of wood through it, by way of spit, and holding it over a brisk fire, until the feathers are burnt off, when it is ready for eating, in their taste. They never drink water; only cocoa-nut milk and a liquor called *soura*, which oozes from the cocoa-nut tree after cutting off the young sprouts or flowers. This they suffer to ferment before it is used, and then it is intoxicating, to which quality they add much by their method of drinking it, by sucking it slowly through a small straw. After eating, the young men and women, who are fancifully drest with leaves, go to dancing, and the old people surround them smoking *tobacco* and drinking *soura*. The dancers, while performing, sing some of their tunes, which are far from wanting harmony, and to which they keep exact time. Of musical instruments they have only one kind, and that the simplest. It is a hollow bamboo about 2½ feet long and three inches in diameter; along the outside of which there is stretched from end to end a single string made of the threads of a split cane; and the place under the string is hollowed a little, to prevent it from touching. This instrument is played upon in the same manner as a guitar. It is capable of producing but few notes; the performer however makes it speak harmoniously, and generally accompanies it with the voice.

What they know of physic is small and simple. I had once occasion to see an operation in surgery performed on the toe of a young girl, who had been stung by a scorpion or centipee. The wound was attended with a considerable swelling, and the little patient seemed in great pain. One of the natives produced the under jaw of a small fish, which was long, and planted with two rows of teeth as sharp as needles: taking this in one hand, and a small stick by way of hammer in the other, he struck the teeth three or four times into the swelling, and made it bleed freely: the toe was then bound up with certain leaves, and next day the child was running about perfectly well.

Their houses are generally built upon the beach in villages of fifteen or twenty houses each; and each house contains a family of twenty persons and upwards. These habitations are raised upon wooden pillars about ten feet from the ground; they are round and, having no windows, look like bee-hives, covered with thatch. The entry is through a trap-door below, where the family mount by a ladder, which is drawn up at night. This manner of building is intended to secure the houses from being infested with snakes and rats; and for that purpose the pillars are bound round with a smooth kind of leaf, which prevents animals from being able to mount; besides which, each pillar has a broad round flat piece of wood near the top of it, the projecting of which effectually prevents the further progress of such vermin as may have passed the leaf The flooring is made with thin strips of bamboos, laid at such distances from one another as to leave free admission for light and air; and the inside is neatly finished and decorated with fishing lances, nets, &c.

The art of making cloth of any kind is quite unknown to the inhabitants of this island; what they have is got from the ships that come to trade in cocoa-nuts. In exchange for their nuts (which are reckoned the finest in this part of *India)* they will accept of but few articles; what they chiefly wish for is cloth of different colours, hatchets and hanger-blades, which they use in cutting down the nuts. Tobacco and arrack they are very fond of; but except these in presents. They have no money of their own, nor will they allow any value to the coin of other countries, further than as they happen to fancy them for ornaments ; the young women sometimes hanging strings of dollars about their necks. However, they are good judges of gold and silver ; and it is no easy matter to impose baser metals upon them as such.

They purchase a much larger quantity of cloth than is consumed upon their own island. This is intended for the *Choury* market. *Choury* is a small island to the southward of theirs, to which a large fleet of their boats sails every year about the month of *November*, to exchange cloth for *canoes ;* for they cannot make these themselves. This voyage they perform by the help of the sun and stars, for they know nothing of the compass.

In their disposition there are two remarkable qualities. One is their entire neglect of compliment and ceremony, and the other, their aversion to dishonesty. A *Carnicobarian* travelling to a distant village upon business or amusement, passes through many towns in his way without perhaps speaking to any one : if he is hungry or tired, he goes up into the nearest house, and helps himself to what he wants, and sits till he is rested, without taking the smallest notice of any of the family, unless he has business or news to communicate. Theft or robbery is so very rare amongst them, that a man going out of his house, never takes away his ladder, or shuts his door, but leaves it open for any body to enter that pleases, without the least apprehension of having any thing stolen from him.

Their intercourse with strangers is so frequent, that they have acquired in general the barbarous language of the *Portuguese*, so common over *India ;* their own tongue has a sound quite different from most others, their words being pronounced with a kind of stop, or catch in the throat, at every syllable. The few following words will serve to shew those who are acquainted with other *Indian* languages, whether there is any similitude between them.

A man,	*Kegonia.*	To eat,	*Gnia.*
A woman,	*Kecanna.*	To drink,	*Okk.*
A child,	*Chu.*	Yams,	*T'owla.*
To laugh,	*Ayelaur.*	To weep,	*Poing.*
A canoe,	*App.*	A pine-apple,	*Frung.*
A house,	*Albanum.*	To sleep	*Loom loom.*
A fowl,	*Hayám.*	A dog,	*T'amam.*
A hog,	*Hown.*	Fire,	*T'amia.*
Fish,	*Ka.*	Rain,	*Koomra.*

They have no notion of a God; but they believe firmly in the Devil, and worship him from fear. In every village there is a high pole erected with long strings of ground-rattans hanging from it, which, it is said, has the virtue to keep him at a distance. When they see any signs of an approaching storm, they imagine that the Devil intends them a visit; upon which many superstitious ceremonies are performed. The people of every village march round their own boundaries, and fix up at different distances small sticks split at the top, into which split they put a piece of cocoa-nut, a wisp of tobacco, and the leaf of a certain plant. Whether this is meant as a peace-offering to the Devil, or a scarcecrow to frighten him away, does not appear.

When a man dies, all his live stock, cloth, hatchets, fishing-lances, and in short every moveable thing he possessed is buried with him; and his death is mourned by the whole village. In one view, this is an excellent custom, seeing it prevents all disputes about the property of the deceased amongst his relations. His wife must conform to custom, by having a joint cut off from one of her fingers; and, if she refuses this, she must submit to have a deep notch cut in one of the pillars of her house.

I was once present at the funeral of an old woman. When we went into the house, which had belonged to the deceased, we found it full of her female relations; some of them were employed in wrapping up the corpse in leaves and cloth, and others tearing to pieces all the cloth which had belonged to her. In another house hard by, the men of the village, with a great many others from the neighbouring towns, were sitting drinking *soura* and smoking tobacco. In the mean time two stout young fellows were busy digging a grave in the sand near the house. When the women had done with the corpse, they set up a most hideous howl, upon which the people began to assemble round the grave, and four men went up into the house to bring down the body; in doing this they were much interrupted by a young man, son to the deceased, who endeavoured with all his might to prevent them, but finding it in vain, he clung round the body, and was carried to the grave along with it: there, after a violent struggle, he was turned away and conducted back to the house. The corpse now put into the grave, and the lashings which bound the legs and arms cut, all the live stock which had been the property of the deceased, consisting of about half a dozen hogs and as many fowls, was killed, and flung in above it. A man then approached with a bunch of leaves stuck upon the end of a pole, which he swept two or three times gently along the corpse, and then the grave was filled up. During the ceremony, the women continued to make the most horrible vocal concert imaginable: the men said nothing. A few days afterwards, a kind of monument was erected over the grave, with a pole upon it, to which long strips of cloth of different colours were hung.

Polygamy is not known among them; and their punishment of adultery is not less severe than effectual. They cut, from the man's offending member, a piece of the foreskin proportioned to the frequent commission or enormity of the crime.

There seems to subsist among them a perfect equality. A few persons, from their age, have a little more respect paid to them; but there is no appearence of authority one over another. Their society seems bound rather by mutual obligations continually conferred and received: the simplest and best of all ties.

The inhabitants of the *Andamans* are said to be *Cannibals.* The people of *Carnicobar* have a tradition among them, that several canoes came from *Andaman* many years ago, and that the crews were all armed, and committed great depredations, and killed several of the *Nicobarians.* It appears at first remarkable, that there should be such a wide difference between the manners of the inhabitants of islands so near to one another; the *Andamans* being savage *Cannibals,* and the others, the most harmless inoffensive people possible. But it is accounted for by the following historical anecdote, which, I have been assured, is matter of fact. Shortly after the *Portuguese* had discovered the passage to *India* round the *Cape of Good Hope,* one of their ships, on board of which were a number of *Mozambique* negroes, was lost on the *Andaman* islands, which were till then uninhabited. The blacks remained in the island and settled there: the *Europeans* made a small shallop, in which they sailed to *Pegu.* On the other hand, the *Nicobar* islands were peopled from the opposite main and the coast of *Pegu;* in proof of which, the *Nicobar* and *Pegu* languages are said, by those acquainted with the latter, to have much resemblance.

XXII.

The DESIGN *of a* TREATISE *on the* PLANTS *of* INDIA.

By the PRESIDENT.

THE greatest, if not the only, obstacle to the progress of knowledge in these provinces, except in those branches of it which belong immediately to our several professions, is our want of leisure for general researches; and, as *Archimedes*, who was happily master of his time, had not *space* enough to move the greatest weight with the smallest force, thus we, who have ample space for our inquiries, really want *time* for the pursuit of them. "Give " me a place to stand on, said the great mathematician, and I " will move the whole earth:" *Give us time*, we may say, *for our investigations, and we will transfer to* Europe *all the sciences, arts, and literature of* Asia. "Not to have despaired," however, was thought a degree of merit in the *Roman* General, even though he was defeated; and, having some hope that others may occasionally find more leisure, than it will ever, at least in this country, be my lot to enjoy, I take the liberty to propose a work, from which very curious information, and possibly very solid advantage, may be derived.

Some hundreds of plants, which are yet imperfectly known to *European* botanists; and with the virtues of which they are wholly unacquainted, grow wild on the plains and in the forests of *India*. The *Amarcòsh*, an excellent vocabulary of the *Sanscrit* language, contains in one chapter the names of about three hundred medicinal vegetables; the *Médinì* may comprize many more; and the *Dravyábhidhána*, or *Dictionary of Natural Productions*, includes, I believe, a far greater number; the properties of which are distinctly related in medical tracts of approved authority. Now the first step, in compiling a treatise on the plants of *India*, should be to write their true names in *Roman* letters, according to the most accurate orthography, and in *Sanscrit* preferably to any vulgar dialect, because a learned language is fixed in books, while popular idioms are in constant fluctuation, and will not perhaps, be understood a century hence by the inhabitants of these *Indian* territories, whom future botanists may consult on the common appellations of trees and flowers. The childish denominations of plants from the persons who first described them, ought wholly to be rejected; for *Champaca* and *Hinna* seem to me not only more elegant, but far properer, designations of an *Indian* and an *Arabian* plant, than *Michelia* and *Lawsonia;* nor can I see without pain, that the great *Swedish* botanist considered it as *the supreme and only reward of labour* in this part of natural history, to preserve a name by hanging it on a blossom, and that he declared this mode of promoting and adorning botany, worthy of being *continued with holy reverence*, though so high an honour, he says, *ought to be conferred with chaste reserve, and not prostituted for the purpose of conciliating the good-will, or eternizing the memory, of any but his chosen followers; no, not even of saints.* His list of *an hundred and fifty* such names clearly shows, that his excellent works are the true basis of his just celebrity, which would have been feebly supported by the stalk of the *Linnæa*. From what proper name the *Plantain* is called *Musa*, I do not know; but it seems to be the *Dutch* pronunciation of the *Arabic* word for that vegetable, and ought not, therefore, to have appeared in his list; though, in my opinion, it is the only rational name in the muster-roll. As to the system of *Linnæus*, it is the system of Nature, subordinate indeed to the beautiful arrangement of *natural orders*, of which he hath given a rough sketch, and which may hereafter, perhaps, be completed: but the distribution of vegetables into *classes*, according to the number, length, and position of the stamens and pistils, and of those *classes* into *kinds* and *species*, according to certain marks of discrimination, will ever be found the clearest and most convenient of methods, and should therefore be studiously observed in the work, which I now suggest; but I must be forgiven, if I propose to reject the *Linnæan* appellations of the twenty-four *classes*, because, although they appear to be *Greek*, (and, if they really were so, that alone might be thought a sufficient objection) yet in truth they are not *Greek*, nor even formed by analogy to the language of *Grecians;* for *Polygamos*, *Monandros*, and the rest of that form, are both masculine and feminine; *Polyandria*, in the abstract, never occurs, and *Polyandrion* means a public cemitery ; *diæcia* and *diæcus* are not found in books of authority ; nor, if they were, would they be derived from *dis*, but from *dia*, which would include the *triæcia ;* let me add that the *twelfth* and *thirteenth* classes are ill distinguished by their appellations, independently of other exceptions to them, since the real distinction between them consists not so much in the *number* of their staments, as in the *place*, where they are inserted ; and that the *fourteenth* and *fifteenth* are not more accurately discriminated by two words formed in defiance of grammatical analogy, since there are but *two* powers, or two *diversities of length* in each of those classes. *Calycopolyandros* might, perhaps, not inaccurately denote a flower of the *twelfth* class ; but such a compound would still savour of barbarism or pedantry ; and the best way to amend such a system of words is to efface it, and supply its place by a more simple nomenclature, which may easily be found. Numerals may be used for the *eleven* first classes, the former of two numbers being always appropriated to the *stamens*, and the latter to the *pistils*. Short phrases, as *on the calyx* or *calice*, *in the receptacle*, *two long*, *four long from one base*, *from two* or *many*, *bases*, *with anthers connected*, *on the pistils*, *in two flowers*, *in two distinct plants*, *mixed*, *concealed*, or the like, will answer every purpose of discrimination ; but I do not offer this as a perfect substitute for the words, which I condemn. The allegory of *sexes* and *nuptials*, even if it were complete, ought, I think, to be discarded, as unbecoming the gravity of men, who, while they search for truth, have no business to inflame their imaginations ; and, while they profess to give descriptions, have nothing to do with metaphors. Few passages in *Aloisia*, the most impudent book ever composed by man, are more wantonly indecent than the hundred-forty sixth number of the *Botanical Philosophy*, and the broad comment of its grave author, who *dares*, like *Octavius* in his epigram, *to speak with* Roman *simplicity ;* nor can the *Linnæan* description of the *Arum*, and many other plants, be read in *English* without exciting ideas which the occasion does not require. Hence it is that no well-born and well-educated woman can be advised to amuse herself with botany as it is now explained, though a more elegant and delightful study, or one more likely to assist and embellish other female accomplishments, could not possibly be recommended.

When the *Sanscrit* names of the *Indian* plants have been correctly written in a large paper-book, one page being appropriated to each, the fresh plants themselves, procured in their respective seasons, must be concisely, but accurately, *classed* and *described*; after which their several *uses* in medicine, diet, or manufactures, may be collected with the assistance of *Hindu* physicians from the medical books in *Sanscrit*, and their accounts either disaproved or established by repeated experiments, as fast as they can be made with exactness.

By way of example, I annex the descriptions of five *Indian* plants; but am unable, at this season, to re-examine them, and wholly despair of leisure to exhibit others, of which I have collected the names, and most of which I have seen in blossom.

I. MUCHUCUNDA.

Twenty, from One Base.

Cal. Five-parted, thick; leaflets, oblong.

Cor. Five petals, oblong.

Stam. From twelve to fifteen, rather long, fertile; five shorter, sterile. In some flowers, the *unprolific* stamens longer.

Pist. *Style* cylindric.

Peric. A capsule, with five cells, many-seeded.

Seeds. Roundish, compressed, winged.

Leaves. Of many different shapes.

Uses. The quality refrigerant.

One flower, steeped a whole night in a glass of water, forms a cooling mucilage of use in virulent gonorrhœas. The *Muchucunda* called also *Pichuca*, is exquisitely fragrant: its calyx is covered with an odoriferous dust; and the dried flowers in fine powder, taken as snuff, are said, in a *Sanscrit* book, almost instantaneously to remove a nervous head-ach.

Note. This plant differs a little from the *Pentapetes* of *Linnæus*.

II. BILVA OR MA'LU'RA.

Many on the Receptacle, and One.

Cal. Four or five cleft beneath.

Cor. Four or five petals ; mostly reflex.

Stam. Forty to forty-eight filaments ; anthers mostly erect.

Pist. *Germ* roundish ; *Style* smooth, short ; *Stigma* clubbed.

Peric. A spheroidal berry, very large ; many-seeded.

Seeds. Toward the surface ovate, in a pellucid mucus.

Leaves. Ternate ; common petiole long ; leaflets subovate ; obtusely notched with short petioles ; some almost lanced.

Stem. Armed with sharp thorns.

Uses. The fruit nutritious, warm, cathartic ; in taste delicious, in fragrance exquisite : its aperient and detersive quality, and its efficacy in removing habitual costiveness, having been proved by constant experience. The mucus of the seed is, for some purposes, a very good cement.

Note. This fruit is called *Srīp'hala*, because it sprang, say the *Indian* poets, from the milk of *Srī*, the Goddess of Abundance, who bestowed it on mankind at the request of *Iswara*, whence he alone wears a chaplet of *Bilva* flowers : to him only the *Hindus* offer them ; and, when they see any of them fallen on the ground, they take them up with reverence, and carry them to his temple. From the first blossom of this plant, that I could inspect, I had imagined that it belonged to the same class with the *Durio*, because the filaments appeared to be distributed in five sets ; but in all that I have since examined, they are perfectly distinct.

III. SRINGA'TACA.

Four and One.

Cal. Four cleft, with a long peduncle above.

Cor. Four petals.

Stam. Anthers kidney-shaped.

Pist. *Germ* roundish ; *Style* long, as the filaments ; *Stigma* clubbed.

Seed. A *Nut* with four opposite angles (two of them Sharp thorns) formed by the *Calyx*.

Leaves. Those which float on the water are rhomboidal ; the two upper sides unequally notched, the two lower, right lines. Their petioles, buoyed up by spindle-shaped spongy substances, not bladders.

Root. Knotty, like coral.

Uses. The fresh kernel, in sweetness and delicacy, equals that of the filbered. A mucus, secreted by minute glands, covers the wet leaves, which are considered as cooling.

Note. It seems to be the floating *Trapa* of *Linnæus.*

IV. PU'TICARAJA.

Ten and One.

Cal. Five-cleft.

Cor. Five equal petals.

Peric. A thorny legumen ; two seeds.

Leaves. Oval, pinnated.

Stem. Armed.

Uses. The seeds are very bitter, and, perhaps, tonic ; since one of them, bruised and given in two doses, will, as the *Hindus* assert, cure an intermittent fever.

V. MADHU'CA. *(See Vol. I. Page 300.)*

Many, *not* on the Receptacle, and One.

Cal. Perianth four or five-leaved.

Cor. One-petaled. *Tube* inflated, fleshy. *Border* nine, or ten, parted.

Stam. Anthers from twelve to twenty-eight, erect, acute, sub-villous.

Pist. Germ roundish ; *Style* long, awl-shaped.

Peric. A *Drupe*, with two or three *Nuts ?*

Leaves. Oval, somewhat pointed.

Uses. The *tubes*, esculent, nutritious ; yielding, by distillation, an inebriating spirit, which, if the sale of it were duly restrained by law, might be applied to good purposes. A useful oil is expressed from the seed.

Note. It resembles the *Bassia* of *Koenig.*

Such would be the method of the work which I recommend ; but even the specimen which I exhibit, might, in skilful hands, have been more accurate. Engravings of the plants may be annexed ; but I have more than once experienced, that the best anatomical and botanical prints give a very inadequate, and sometimes a very false notion of the objects which they were intended to represent. As we learn a new language by reading approved compositions in it with the aid of a Grammer and Dictionary, so we can only study with effect the natural history of vegetables by analysing the plants themselves with the *Philosophia Botanica*, which is the *Grammar*, and the *Genera et Species Plantarum*, which may be considered as the *Dictionary*, of that beautiful language, in which nature would teach us what plants we must avoid as noxious, and what we must cultivate as salutary, for that the qualities of plants are *in some degree* connected with the *natural orders* and *classes* of them, a number of instances would abundantly prove.

XXIII.

On the DISSECTION *of the* PANGOLIN, *in a Letter to* GENERAL CARNAC *from* ADAM BURT, *Esq.*

Communicated by the GENERAL.

SIR,

IN compliance with your desire, I most willingly do myself the honour to present to you my observations and reflections on the dissection of one of those animals, of which we have a print, with a very short account, in the *First Volume* of the *Transactions of the Asiatic Society*. The animal, from which that likeness has been taken, was sent by Mr. *Leslie*, from *chitra*, to the President Sir *William Jones*. It is distinguished in the *Transactions* by a name, which I do not at present remember ; but probably the animal is of the same genus with the *manis*, as described in the former edition of the *Encyclopædia Britannica*, or, perhaps, not different from the *Pangolin* of *Buffon*.

The representation of this animal in the *Memoirs* of the *Asiatic Society*, makes it unnecessary for me to enter into any general description of its external figure and appearance. There are on each foot five claws, of which the outer and inner are small when compared with the other three. There are no distinct toes ; but each nail is moveable by a joint at its root. This creature is extremely inoffensive. It has *no teeth ;* and its feet are unable to grasp. Hence it would appear that Nature, having furnished it with a coat of mail for its protection, has, with some regard to justice, denied it the powers of acting with hostility against its fellow creatures. The nails are well adapted for digging in the ground ; and the animal is so dexterous in eluding its enemies by concealing itself in holes and among rocks, that it is extremely difficult to procure one.

The upper jaw is covered with a cross cartilaginous ridge, which though apparently not at all suited to any purposes of mastication, may, by increasing the surface of the palate, extend the sense of

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taste. The œsophagus admitted my fore-finger with ease. The tongue at the bottom of the mouth is nearly about the size of the little finger, from whence it tapers to a point. The animal at pleasure protrudes this member a great way from the mouth. The tongue arises from the ensiform cartilage, and the contiguous muscles of the belly, and passes in form of a round distinct muscle from over the stomach, through the thorax, immediately under the sternum ; and interior to the windpipe in the throat. When dissected out, the tongue could be easily elongated so as to reach more than the length of the animal, exclusive of its tail. There is a cluster of salivary glands seated around the tongue, as it enters the mouth. These will necessarily be compressed by the action of the tongue; so as occasionally to supply a plentiful flow of their secretion.

The stomach is *cartilaginous*, and analogous to that of the gallinaceous tribe of birds. It was filled with small stones and gravel, which in this part of the country, are almost universally calcareous. The inner surface of the stomach was rough to the feel, and formed into folds, the interstices of which were filled with a frothy secretion. The guts were filled with a sandy pulp, in which, however, were interspersed a few distinct small stones. No vestiges of any animal or vegetable food could be traced in the whole *primæ viæ*. The gall-bladder was distended with a fluid, resembling in colour and consistence the dregs of beer.

The subject was a female: its dugs were two, seated on the breast. The uterus and organs of generation were evidently those of a viviparous animal.

Forcibly struck with the phenomena which this quadruped exhibited, my imagination at once overleaped the boundaries by which sciense endeavours to circumscribe the productions and the ways of Nature ; and believing with *Buffon*, *que tout ce qui peut être est*, I did not hesitate to conjecture, that this animal might possibly derive its nourishment from mineral substances. This idea I accordingly hazarded in an address to Colonel *Kid*. The spirit of inquiry, natural to that gentleman, could be ill satisfied by ideas thrown out apparently at random ; and he soon called on me to explain my opinion, and its foundation.

Though we have perhaps no clear idea of the manner in which vegetables extract their nourishment from earth, yet the fact being so, it may not be unreasonable to suppose that some animal may derive nutriment by a process somewhat similar. It appears to me, that facts produced by *Spallanzani* directly invalidate the experiments, from which he has drawn the inference, that fowls swallow stones merely from stupidity; and that such substances are altogether unnecessary to those animals. He reared fowls, without permitting them ever to swallow sand or stones; but he also established the fact, that carnivorous animals may become frugivorous; and herbivorous animals may come to live on flesh. A wood-pidgeon he brought to thrive on putrid meat. The experiment on fowls, then, only corroborates the proof, that we have it in our power by habits to alter the natural constitution of animals. Again the eminent investigator of truth found, that fowls died when fed on stones alone; but surely that fact is far short of proving that such substances are not agreeable to the original purposes of nature in the digestive process of these animals. When other substances shall have been detected in the stomach of this animal, my inference, from what I have seen, must necessarily fall to the ground. But if, like other animals with muscular and cartilaginous stomachs, this singular quadruped consumes grain, it must be surprising that no vestige of such food was found present in the whole alimentary canal, since in that thinly inhabited country, the wild animals are free to feed without intrusion from man. Nor can it be inferred from the structure of the stomach, that this animal lives on ants or on insects. Animals devoured as food, though of considerable size and solidity, with a proportionally small extent of surface to be acted on by the gastric juice and the action of the stomach, are readily dissolved and digested by animals possessing not a cartilaginous, but a membranaceous stomach; as for instance, a frog in that of a snake.

In the stomach many minerals are soluble, and the most active things which we can swallow. Calcareous substances are readily acted on. Dr. *Priestly* has asked, "May not phlogistic matter be the "most essential part of the food and support of both vegetable and "animal bodies?" I confess, that Dr. *Priestly's* finding cause to propose the question, inclines me to suppose that the affirmative to it may be true. Earth seems to be the basis of all animal matter. The growth of the bones must be attended with a constant supply; and in

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the human species there is a copious discharge of calcareous matter thrown out by the kidneys and salivary glands. May not the quadruped in question derive phlogiston from earth? salt, from mineral substances? And, as it is not deprived of the power of drinking water, what else is necessary to the subsistence of his corporeal machine?

Considering the scaly covering of this animal, we may conceive that it may be at least necessary for its existence, on that account, to imbibe a greater proportion of earth than is necessary to other animals. It may deserve consideration, that birds are covered with feathers, which in their constituent principles approach to the nature of horn and bone. Of these animals the gallinaceous tribe swallow stones; and the carnivorous take in the feathers and bones of their prey: the latter article is known to be soluble in the membranaceous stomachs; and hence is a copious supply of the earthy principles. In truth, I do not know that any thing is soluble in the stomach of animals, which may not be thence absorbed into their circulating system; and nothing can be so absorbed without affecting the whole constitution.

What I have here stated is all that I could advance to the Colonel; but my opinion has been since not a little confirmed, by observing the report of experiments by M. *Bruquatelli* of *Pavia*, on the authority of M. *Crell*, by which we learn, that some birds have so great a dissolvent power in the gastric juice, as to dissolve in their stomachs flints, rock-crystal, calcareous stones, and shells.

I beg only farther to observe, that some things in *Buffon's* description of the Pangolin, not apparently quite applicable to this animal, might have been owing to his description being only from the view of a dried preparation, in which the organs of generation would be obliterated, and the dugs shrivelled away so as to be imperceptible; else that elegant philosopher could not have asserted that, "*tous* "*les animaux quadrupedes, qui sont couverts d'écailles, sont ovipares.*"

Excuse my prolixity, which is only in me the necessary attendant of my superficial knowledge of things. In ingenuousness, however, I hope that I am not inferior to any man: and I am proud to subscribe myself,

Sir,
Your most obedient and humble servant,
ADAM BURT.

Gya, September 14, 1789.

A Letter from DOCTOR ANDERSON *to* SIR WILLIAM JONES.

DEAR SIR,

THE male *Lac* insect having hitherto escaped the observation of naturalists, I send the enclosed description, made by Mr. *William Roxburgh*, Surgeon on this establishment, and Botanist to the Honorable Company, in hopes you will give it a place in the publication of your Society, as Mr. *Roxburgh's* discovery will bring Lac a Genus into the Class Hemiptera of *Linnæus*.

I am, with esteem,
Dear Sir,
Your very obedient servant,

JAMES ANDERSON.

Fort St. George, January 2, 1790.

XXIV.

On the LA'CSHA', *or* LAC, INSECT.

By Mr. W. ROXBURGH.

SOME pieces of very fresh-looking lac, adhering to small branches of *mimosa cinerea*, were brought me from the mountains on the 20th of last month. I kept them carefully, and to-day, the 4th of *December*, fourteen days from the time they came from the hills, myriads of exceedingly minute animals were observed creeping about the lac and branches it adhered to, and more still issuing from small holes over the surface of the cells: other small and perforated excrescences were observed with a glass amongst the perforations,

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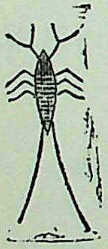

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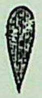

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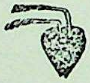

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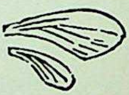

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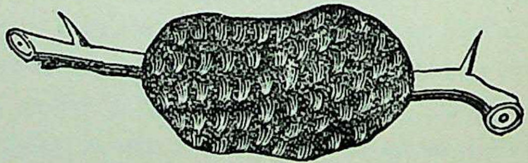

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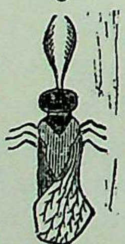

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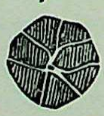

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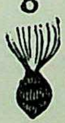

from which the minute insects issued, regularly two to each hole, and crowned with some very fine white hairs. When the hairs were rubbed off, two white spots appeared. The animals, when single, ran about pretty briskly; but in general they were so numerous as to be crowded over one another. The body is oblong, tapering most towards the tail, below plain, above convex, with a double, or flat margin: laterally on the back part of the thorax are two small tubercles, which may be the eyes: the body behind the thorax is crossed with twelve rings; legs six; feelers (antennæ) half the length of the body, jointed, hairy, each ending in two hairs as long as the antennæ; rump, a white point between two terminal hairs, which are as long as the body of the animal; the mouth I could not see. On opening the cells, the substance that they were formed of cannot be better described, with respect to appearance, than by saying it is like the transparent amber that beads are made of: the external covering of the cells may be about half a line thick, is remarkably strong and able to resist injuries; the partitions are much thinner; the cells are in general irregular squares, pentagons, and hexagons, about an eighth of an inch in diameter, and ¼ deep; they have no communication with each other: all these I opened during the time the animals were issuing, contained in one-half a small bag filled with a thick red jelly-like liquor, replete with what I take to be eggs; these bags, or utriculi, adhere to the bottom of the cells, and have each two necks, which pass through perforations in the external coat of the cells, forming the fore-mentioned excrescences, and ending in some very fine hairs. The other half of the cells have a distinct opening, and contain a white substance, like some few filaments of cotton rolled together, and numbers of the insects themselves ready to make their exit. Several of the same insects I observed to have drawn up their legs, and to lie flat; they did not move on being touched, nor did they show any signs of life with the greatest irritation.

December 5. The same minute hexapedes continue issuing from their cells in numbers; they are more lively, of a deepened red colour, and fewer of the motionless sort. To-day I saw the mouth; it is a flattened point, about the middle of the breast, which the little animal projects on being compressed.

December 6. The male insects I have found to-day. A few of them are constantly running among the females most actively: as yet they are scarce more, I imagine, than one to 5000 females, but twice their size. The head is obtuse; eyes black, very large; antennæ clavated, feathered, about ⅔ the length of the body; below the middle an articulation, such as those in the legs; colour between the eyes a beautiful shining green; neck very short; body oval, brown; abdomen oblong, the length of body and head; legs six; wings membranaceous, four, longer than the body, fixed to the sides of the thorax, narrow at their insertions, growing broader for ⅔ of their length, then rounded; the anterior pair is twice the size of the posterior; a strong fibre runs along their anterior margins; they lie flat, like the wings of a common fly, when it walks or rests; no hairs from the rump; it springs most actively to a considerable distance on being touched; mouth in the under part of the head; maxillæ transverse. To-day the female insects continue issuing in great numbers, and move about as on the 4th.

December 7. The small red insects still more numerous, and move about as before: winged insects, still very few, continue active. There have been fresh leaves and bits of the branches of both *mimosa cinerea* and *corinda* put into the wide mouthed bottle with them: they walk over them indifferently, without showing any preference, nor inclination to work nor copulate. I opened a cell whence I thought the winged flies had come, and found several, eight or ten, more in it, struggling to shake off their incumbrances: they were in one of those utriculi mentioned on the 4th, which ends in two mouths, shut up with fine white hairs, but one of them was open for the exit of the flies; the other would no doubt have opened in due time: this utriculus I found now perfectly dry, and divided into cells by exceeding thin partitions. I imagine, before any of the flies made their escape, it might have contained about twenty. In these minute cells with the living flies, or whence they had made their escape, were small dry dark coloured compressed grains, which may be the dried excrements of the flies.

NOTE *by the President.*

THE *Hindus* have six names for *Lac;* but they generally call it *Lácshà*, from the *multitude* of small insects, who, as they believe, discharge it from their stomachs, and at length destroy the tree on which they form their colonies. A fine *Pippala* near *Crishnanagar*, is now almost wholly destroyed by them.

XXV.

THE SEVENTH ANNIVERSARY DISCOURSE,

DELIVERED 25 FEBRUARY 1790.

BY THE PRESIDENT.

GENTLEMEN,

ALTHOUGH we are at this moment considerably nearer to the frontier of *China* than to the farthest limit of the *British* dominions in *Hindustán*, yet the first step that we shall take in the philosophical journey, which I propose for your entertainment at the present meeting, will carry us to the utmost verge of the habitable globe known to the best geographers of old *Greece* and *Egypt;* beyond the boundary of whose knowledge we shall discern from the heights of the northern mountains an empire nearly equal in surface to a square of fifteen degrees; an empire, of which I do not mean to assign the precise limits, but which we may consider, for the purpose of this dissertation, as embraced on two sides by *Tartary* and *India*, while the ocean separates its other sides from various *Asiatic* isles of great importance in the commercial system of *Europe*. Annexed to that immense tract of land is the peninsula of *Corea*, which a vast oval bason divides from *Nifon* or *Japan*, a celebrated and imperial island, bearing in arts and in arms, in advantage of situation, but not in felicity of government, a pre-eminence among eastern kingdoms analogous to that of *Britain* among the nations of the west. So many climates are included in so prodigious an area, that while the principal emporium of *China* lies nearly under the tropic, its metropolis enjoys the temperature of *Samarkand:* such too is the diversity of soil in its fifteen provinces, that, while some of them are exquisitely fertile, richly cultivated, and extremely populous, others are barren and rocky, dry and unfruitful, with plains as wild or mountains as rugged as any in *Scythia*, and those either wholly deserted, or peopled by savage hordes, who, if they be not still independent, have been very lately subdued by the perfidy, rather than the valour, of a monarch, who has perpetuated his own breach of faith in a *Chinese* poem, of which I have seen a translation.

The word *China*, concerning which I shall offer some new remarks, is well known to the people whom we call the *Chinese*; but they never apply it (I speak of the learned among them) to themselves or to their country: themselves, according to Father *Visdelou*, they describe as the *people of Han*, or of some other illustrious family, by the memory of whose actions they flatter their national pride; and their country they call *Chúm-cuë*, or the *Central Kingdom*, representing it in their symbolical characters by a parallelogram exactly bissected. At other times they distinguish it by the words *Tien-hia*, or *What is under Heaven;* meaning *all that is valuable on Earth.* Since they never name themselves with moderation, they would have no right to complain, if they knew that *European* authors have ever spoken of them in the extremes of applause or of censure. By some they have been extolled as the oldest and the wisest, as the most learned and most ingenious of nations; whilst others have derided their pretensions to antiquity, condemned their government as abominable, and arraigned their manners as inhuman, without allowing them an element of science, or a single art for which they have not been indebted to some more ancient and more civilized race of men. The truth perhaps lies, where we usually find it, between the extremes; but it is not my design to accuse or to defend the *Chinese*, to depress or to aggrandize them: I shall confine myself to the discussion of a question connected with my former discourses, and far less easy to be solved than any hitherto started: "Whence came the singular people, who long had governed "*China*, before they were conquered by the *Tartars?*" On this problem (the solution of which has no concern, indeed, with our political or commercial interests, but a very material connection, if I mistake not, with interests of a higher nature) four opinions have been advanced, and all rather peremptorily asserted than supported by argument and evidence. By a few writers it has been urged, that the *Chinese* are an original race, who have dwelled for ages, if not from eternity, in the land which they now possess; by others, and chiefly by the missionaries, it is insisted that they

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sprang from the same stock with the *Hebrews* and *Arabs ;* a third assertion is that of the *Arabs* themselves and of M. *Pauw*, who hold it indubitable, that they were originally *Tartars* descending in wild clans from the steeps of *Imaus ;* and a fourth, at least as dogmatically pronounced as any of the preceding, is that of the *Brahmens*, who decide, without allowing any appeal from their decision, that the *Chínas* (for so they are named in *Sanscrit*) were *Hindus* of the *Cshatriya*, or military class, who, abandoning the privileges of their tribe, rambled in different bodies to the north-east of *Bengal ;* and, forgetting by degrees the rites and religion of their ancestors, established separate principalities, which were afterwards united in the plains and valleys, which are now possessed by them. If any one of the three last opinions be just, the first of them must necessarily be relinquished ; but of those three, the first cannot possibly be sustained, because it rests on no firmer support than a foolish remark, whether true or false, that *Sem* in *Chinese* means *life* and *procreation ;* and because a tea-plant is not more different from a palm than a *Chinese* from an *Arab*. They are men, indeed, as the tea and the palm are vegetables ; but human sagacity could not, I believe, discover any other trace of resemblance between them. One of the *Arabs*, indeed (an account of whose voyage to *India* and *China* has been translated by *Renaudot)* thought the *Chinese* not only handsomer (according to his ideas of beauty) than the *Hindus*, but even more like his own countrymen in features, habiliments, carriages, manners, and ceremonies : and this may be true, without proving an actual resemblance between the *Chinese* and *Arabs*, except in dress and complexion. The next opinion is more connected with that of the *Bráhmens* than M. *Pauw*, probably, imagined ; for, though he tells us expressly that by *Scythians* he meant the *Turks*, or *Tartars*, yet the Dragon on the standard, and some other peculiarities, from which he would infer a clear affinity between the old *Tartars* and the *Chinese*, belonged indubitably to those *Scythians*, who are known to have been *Goths ;* and the *Goths* had manifestly a common lineage with the *Hindus*, if his own argument, in the preface to his *Researches on the Similarity of Language* be, as all men agree that it is, irrefragable. That the *Chinese* were anciently of a *Tartarian* stock, is a propositon which I cannot otherwise disprove for the present, than by insisting on the total dissimilarity of the two races in manners and arts, particularly in the fine arts of imagination, which the *Tartars*, by their own account, never cultivated; but, if we show strong grounds for believing that the first *Chinese* were actually of an *Indian* race, it will follow that M. *Pauw* and the *Arabs* are mistaken. It is to the discussion of this new and, in my opinion, very interesting point, that I shall confine the remainder of my discourse.

In the *Sanscrit Institutes* of civil and religious duties, revealed, as the *Hindus* believe, by *Menu*, the son of *Brahmá*, we find the following curious passage: "Many families of the military class "having gradually abandoned the ordinances of the *Véda*, and the "company of *Bráhmens*, lived in a state of degradation; as the "people of *Pundraca* and *Odra*, those of *Dravira* and *Cambója*, "the *Yavanas* and *Sacas*, the *Páradas* and *Pahlavas*, the *Chínas*, "and some other nations." A full comment on this text would here be superfluous; but, since the testimony of the *Indian* author, who, though certainly not a divine personage, was as certainly a very ancient lawyer, moralist, and historian, is direct and positive, disinterested and unsuspected, it would, I think, decide the question before us, if we could be sure that the word *Chína* signified a *Chinese*, as all the *Pandits*, whom I have separately consulted, assert with one voice. They assure me, that the *Chínas* of *Menu* settled in a fine country to the north-east of *Gaur*, and to the east of *Cámarúp* and *Népàl*; that they have long been, and still are, famed as ingenious artificers; and that they had themselves seen old *Chinese* idols, which bore a manifest relation to the primitive religion of *India* before *Buddha's* appearance in it. A well-informed *Pandit* showed me a *Sanscrit* book in *Cashmirian* letters, which, he said, was revealed by *Siva* himself, and entitled *Sactisangama*. He read to me a whole chapter of it on the heterodox opinions of the *Chínas* who were divided, says the author, into near two hundred clans. I then laid before him a map of *Asia*; and, when I pointed to *Cashmír*, his own country, he instantly placed his finger on the north-western provinces of *China*, where the *Chínas*, he said, first established themselves; but he added, that *Maháchína*, which was also mentioned in his book, extended to the eastern and southern oceans. I believe, nevertheless, that the *Chinese* empire, as we now call it, was not formed when the laws of *Menu* were collected; and for this

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belief, so repugnant to the general opinion, I am bound to offer my reasons. If the outline of history and chronology for the last two thousand years be correctly traced (and we must be hardy sceptics to doubt it) the poems of *Cálidás* were composed before the beginning of our era. Now it is clear, from internal and external evidence, that the *Rámáyan* and *Mahábhárat* were considerably older than the productions of that poet; and it appears from the style and metre of the *Dherma Sástra*, revealed by *Menu*, that it was reduced to writing long before the age of *Válmic* or *Vyása*, the second of whom names it with applause. We shall not, therefore, be thought extravagant if we place the compiler of those laws between a thousand and fifteen hundred years before *Christ;* especially as *Buddha*, whose age is pretty well ascertained, is not mentioned in them; but, in the twelfth century before our era, the *Chinese* empire was at least in its cradle. This fact it is necessary to prove; and my first witness is *Confucius* himself. I know to what keen satire I shall expose myself by citing that philosopher, after the bitter sarcasms of M. *Pauw* against him and against the translators of his mutilated, but valuable works; yet I quote without scruple the book entitled *Lún Yú*, of which I possess the original with a verbal translation, and which I know to be sufficiently authentic for my present purpose. In the second part of it *Con-fu-tsu* declares, that "Although he, like other men, could relate, as mere lessons of morality, "the histories of the first and second imperial houses, yet, *for want* "*of evidence*, he could give no certain account of them." Now, if the *Chinese* themselves do not even pretend that any historical monument existed in the age of *Confucius*, preceding the rise of their third dynasty, about eleven hundred years before the *Christian* epoch, we may justly conclude that the reign of *Vúvam* was in the infancy of their empire, which hardly grew to maturity till some ages after that prince; and it has been asserted by very learned *Europeans*, that even of the third dynasty, which he has the fame of having raised, no unsuspected memorial can now be produced. It was not till the eighth century before the birth of our Saviour, that a small kingdom was erected in the province of *Shen-si*, the capital of which stood nearly in the *thirty-fifth* degree of northern latitude, and about *five* degrees to the west of *Si-gan:* both the country and its metropolis were called *Chín;* and the dominion of its princes was gradually extended to the east and west. A king of *Chín*, who makes a figure in the *Sháhnámah* among the allies of *Afrásiyáb*, was, I presume, a sovereign of the country just mentioned; and the river of *Chín*, which the poet frequently names as the limit of his eastern geography, seems to have been the *Yellow River*, which the *Chinese* introduce at the beginning of their fabulous annals. I should be tempted to expatiate on so curious a subject, but the present occasion allows nothing superfluous, and permits me only to add, that *Mangukhán* died in the middle of the thirteenth century, before the city of *Chín*, which was afterwards taken by *Kublai*, and that the poets of *Irán* perpetually allude to the districts around it which they celebrate, with *Chegil* and *Khoten*, for a number of musk-animals roving on their hills. The territory of *Chín*, so called by the old *Hindus*, by the *Persians*, and by the *Chinese* (while the *Greeks* and *Arabs* were obliged by their defective articulation to miscall it *Sín)* gave its name to a race of emperors, whose tyranny made their memory so unpopular, that the modern inhabitants of *China* hold the word in abhorrence, and speak of themselves as the people of a milder and more virtuous dynasty; but it is highly probable that the whole nation descended from the *Chínas* of *Menu*, and, mixing with the *Tartars* (by whom the plains of *Honan* and the more southern provinces were thinly inhabited) formed by degrees the race of men whom we now see in possession of the noblest empire in *Asia*.

In support of an opinion, which I offer as the result of long and anxious inquiries, I should regularly proceed to examine the language and letters, religion and philosophy of the present *Chinese*, and subjoin some remarks on their ancient monuments, on their sciences, and on their arts, both liberal and mechanical; but their spoken *language* not having been preserved by the usual symbols of articulate sounds, must have been for many ages in a continual flux; their *letters*, if we may so call them, are merely the symbols of ideas; their popular *religion* was imported from *India* in an age comparatively modern; and their *philosophy* seems yet in so rude a state as hardly to deserve the appellation; they have no *ancient monuments*, from which their origin can be traced even by plausible conjecture; their *sciences* are wholly exotic; and their *mechanical arts* have nothing in them characteristic of a particular

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family; nothing which any set of men, in a country so highly favoured by nature, might not have discovered and improved. They have indeed both national music and national poetry, and both of them beautifully pathetic; but of painting, sculpture, or architecture, as arts of imagination, they seem (like other *Asiatics*) to have no idea. Instead, therefore, of enlarging separately on each of those heads, I shall briefly inquire, how far the literature and religious practices of *China* confirm or oppose the proposition which I have advanced.

The declared and fixed opinion of M. *De Guignes*, on the subject before us, is nearly connected with that of the *Bráhmens:* he maintains, that the *Chinese* were emigrants from *Egypt;* and the *Egyptians*, or *Ethiopians* (for they were clearly the same people) had indubitably a common origin with the old natives of *India*, as the affinity of their languages and of their institutions, both religious and political, fully evinces; but that *China* was peopled a few centuries before our era by a colony from the banks of the *Nile* though neither *Persians* nor *Arabs*, *Tartars* nor *Hindus*, ever heard of such an emigration, is a paradox, which the bare authority even of so learned a man cannot support; and, since reason grounded on facts can alone decide such a question, we have a right to demand clearer evidence and stronger arguments than any that he has yet adduced. The hieroglyphics of *Egypt* bear, indeed, a strong resemblance to the mythological sculptures and paintings of *India*, but seem wholly dissimilar to the symbolical system of the *Chinese*, which might easily have been invented (as they assert) by an individual, and might very naturally have been contrived by the first *Chínas*, or outcast *Hindus*, who either never knew, or had forgotten, the alphabetical characters of their wiser ancestors. As to the table and bust of *Isis* they seem to be given up as modern forgeries; but, if they were indisputably genuine, they would be nothing to the purpose; for the letters on the bust appear to have been designed as alphabetical; and the fabricator of them (if they really were fabricated in *Europe)* was uncommonly happy, since two or three of them are exactly the same with those on a metal pillar yet standing in the north of *India*. In *Egypt*, if we can rely on the testimony of the *Greeks*, who studied no language but their own, there were two sets of alphabetical characters; the one *popular*, like the various letters used in our *Indian* provinces ; and the other *sacerdotal*, like the *Dévanágarì*, especially that form of it which we see in the *Véda :* besides which they had two sorts of *sacred sculpture ;* the one simple, like the figures of *Buddha* and the three *Rámas ;* and the other allegorical, like the images of *Ganésa*, or *Divine Wisdom*, and *Isání*, or *Nature*, with all their emblematical accompaniments ; but the *real character* of the *Chinese* appears wholly distinct from any *Egyptian* writing, either mysterious or popular : and, as to the fancy of M. *De Guignes*, that the complicated symbols of *China* were at first no more than *Phenician* monograms, let us hope that he has abandoned so wild a conceit, which he started probably with no other view than to display his ingenuity and learning.

We have ocular proof that the few radical characters of the *Chinese* were originally (like our astronomical and chymical symbols) the pictures or outlines of visible objects, or figurative signs for simple ideas, which they have multiplied by the most ingenious combinations and the liveliest metaphors ; but, as the system is peculiar, I believe, to themselves and the *Japanese*, it would be idly ostentatious to enlarge on it at present ; and, for the reasons already intimated, it neither corroborates nor weakens the opinion which I endeavour to support. The same may as truly be said of their *spoken* language ; for, independently of its constant fluctuation during a series of ages, it has the peculiarity of excluding four or five sounds which other nations articulate, and is clipped into monosyllables, even when the ideas expressed by them, and the written symbols for those ideas, are very complex. This has arisen, I suppose, from the singular habits of the people ; for, though their common tongue be so *musically* accented as to form a kind of recitative, yet it wants those *grammatical* accents, without which all human tongues would appear monosyllabic. Thus *Amita*, with an accent on the first syllable, means, in the *Sanscrit* language, *immeasurable ;* and the natives of *Bengal* pronounce it *Omito ;* but when the religion of *Buddho*, the son of *Máyá*, was carried hence into *China*, the people of that country, unable to pronounce the name of their new God, called him *Foe*, the son of *Mo-ye*, and divided his epithet *Amita* into three syllables *O-mi-to*, annexing to them certain ideas of their own, and expressing them in writing by three distinct symbols. We may judge from this instance, whether a comparison of their spoken tongue with the dialects of other nations can lead to any certain conclusion as to their origin; yet the instance which I have given, supplies me with an argument from analogy, which I produce as conjectural only, but which appears more and more plausible the oftner I consider it. The *Buddha* of the *Hindus* is unquestionably the *Foe* of *China;* but the great progenitor of the *Chinese* is also named by them *Fo-hi*, where the second monosyllable signifies, it seems, a *victim.* Now the ancestor of that military tribe, whom the *Hindus* call the *Chandravansa*, or children of the *Moon*, was, according to their *Puránas* or legends, *Budha*, or the genius of the planet *Mercury*, from whom, in the *fifth* degree, descended a prince named *Druhya;* whom his father *Yayáti* sent in exile to the east of *Hindustán*, with this imprecation, "may thy progeny be ignorant of the *Véda.*" The name of the banished prince could not be pronounced by the modern *Chinese;* and, though I dare not conjecture that the last syllable of it has been changed into *Yao*, I may nevertheless observe that *Yao* was the *fifth* in descent from *Fo-hi*, or at least the fifth mortal in the first imperial dynasty; that all *Chinese* history before him is considered by *Chinese* themselves as poetical or fabulous; that his father *Ti-co*, like the *Indian* king *Yayáti*, was the first prince who married several women; and that *Fo-hi*, the head of their race, appeared, say the *Chinese*, in a province of the west, and held his court in the teritorry of *Chín*, where the rovers, mentioned by the *Indian* legislator, are supposed to have settled. Another circumstance in the parallel is very remarkable: according to father *De Premare*, in his tract on *Chinese* mythology, the mother of *Fo-hi* was the *Daugher of Heaven*, surnamed *Flower-loving;* and, as the nymph was walking alone on the bank of a *river* with a similar name, she found herself on a sudden encircled by a *rain-bow;* soon after which she became pregnant; and at the end of twelve years was delivered of a son radiant as herself, who, among other titles, had that of *Súi*, or *Star of the Year.* Now, in the mythological system of the *Hindus*, the nymph *Róhini*, who presides over the fourth lunar mansion, was the favourite mistress of *Sóma*, or the Moon, among whose numerous epithets we find *Cumudanáyaca*, or *Delighting* in a species of *water-flower*, that blossoms at night; and their offspring was *Budha*, regent of a planet, and called also, from the names of his parents, *Rauhinéya* or *Saumya:* it is true that the learned missionary explains the word *Sú·* by *Jupiter;* but an exact resemblance between two such fables could not have been expected; and it is sufficient for my purpose, that they seem to have a family-likeness. The God *Budha*, say the *Indians*, married *Ilá*, whose father was preserved in a miraculous ark from an universal deluge. Now, although I cannot insist with confidence, that the *rain-bow* in the *Chinese* fable alludes to the *Mosaic* narrative of the flood, nor build any solid argument on the divine personage *Niu-va*, of whose character, and even of whose sex; the historians of *China* speak very doughtfully, I may, nevertheless, assure you, after full inquiry and consideration, that the *Chinese*, like the *Hindus*, believe this earth to have been wholly covered with water, which, in works of undisputed authenticity, they describe as *flowing abundantly, then subsiding, and separating the higher from the lower age of mankind;* that the *division of time*, from which their poetical history begins, just preceded the appearance of *Fo-hi* on the mountains of *Chin;* but that the great *inundation* in the reign of *Yao* was either confined to the lowlands of his kingdom, if the whole account of it be not a fable, or, if it contain any allusion to the flood of *Noah*, has been ignorantly misplaced by the *Chinese* annalists.

The importation of a new religion into *China* in the first century of our era, must lead us to suppose that the former system, whatever it was, had been found inadequate to the purpose of restraining the great body of the people from those offences against conscience and virtue, which the civil power could not reach; and it is hardly possible that, without such restrictions, any government could long have subsisted with felicity; for no government can long subsist without equal justice, and justice cannot be administered without the sanctions of religion. Of the religious opinions entertained by *Confucius* and his followers, we may glean a general notion from the fragments of their works translated by *Couplet.* They professed a firm belief in the Supreme God, and gave a demonstration of his being and of his providence from the exquisite beauty and perfection of the celestial bodies, and the wonderful order of nature in the whole fabric of the visible world. From this belief they deduced a system of ethics, which the philosopher sums up in a few words at the close of the *Lún-yú:* "He," says *Confucius*, "who will be fully persuaded that the Lord of Heaven governs "the universe, who shall in all things choose moderation, who "shall perfectly know his own species, and so act among them "that his life and manners may conform to his knowledge of "God and man, may be truly said to discharge all the duties of a "sage, and to be far exalted above the common herd of the human race." But such a religion and such morality could never have been general; and we find that the people of *China* had an ancient system of ceremonies and superstitions, which the government and the philosophers appear to have encouraged, and which has an apparent affinity with some parts of the oldest *Indian* worship. They believed in the agency of genii, or tutelary spirits, presiding over the stars and the clouds, over lakes and rivers, mountains, valleys, and woods, over certain regions and towns, over all the elements (of which, like the *Hindus*, they reckoned *five*) and particularly over *fire*, the most brilliant of them. To those deities they offered victims on high places: and the following passage from the *Shi-cin*, or *Book of Odes*, is very much in the style of the *Brahmans*:—"Even they, who perform a sacrifice with due "reverence, cannot perfectly assure themselves that the divine "spirits accept their oblations; and far less can they, who adore "the Gods with langour and oscitancy, clearly perceive their sacred illapses." These are imperfect traces indeed, but they are traces of an affinity between the religion of *Menu* and that of the *Chinas*, whom he names among the apostates from it. M. *Le Gentil* observed, he says, a strong resemblance between the funeral rites of the *Chinese* and the *Sráddha* of the *Hindus*; and M. *Bailly*, after a learned investigation, concludes, that "Even the puerile and absurd "stories of the *Chinese* fabulists, contain a remnant of ancient "*Indian* history, with a faint sketch of the first *Hindu* ages." As the *Bauddhas*, indeed, were *Hindus*, it may naturally be imagined that they carried into *China* many ceremonies practised in their own country; but the *Bauddhas* positively forbade the immolation of cattle; yet we know that various animals, even bulls and men, were anciently sacrificed by the *Chinese*; besides which we discover many singular marks of relation between them and the old *Hindus*: as in the remarkable period of *four hundred and thirty two thousand*, and the cycle of *sixty* years; in the predilection for the mystical number *nine*; in many similar fasts and great festivals, especially at the solstices and equinoxes; in the just-mentioned obsequies consisting of rice and fruits offered to the manes of their ancestors: in the dread of dying childless, lest such offerings should be intermitted; and, perhaps, in their common abhorrence of *red* objects, which the *Indians* carried so far, that *Menu* himself, where he allows a *Bráhmen* to trade, if he cannot otherwise support life, absolutely forbids "his trafficking in any sort of *red* cloths, whether "linen or woollen, or made of woven bark." All the circumstances, which have been mentioned under the two heads of *Literature* and *Religion*, seem collectively to prove (as far as such a question admits proof) that the *Chinese* and *Hindus* were originally the same people; but having been separated near four thousand years, have retained few strong features of their ancient consanguinity, especially as the *Hindus* have preserved their old language and ritual, while the *Chinese* very soon lost both; and the *Hindus* have constantly intermarried among themselves, while the *Chinese*, by a mixture of *Tartarian* blood from the time of their first establishment, have at length formed a race distinct in appearance both from *Indians* and *Tartars*.

A similar diversity has arisen, I believe, from similar causes, between the people of *China* and *Japan*; on the second of which nations we have now, or soon shall have, as correct and as ample instruction as can possibly be obtained without a perfect acquaintance with the *Chinese* characters. *Kæmpfer* has taken from M. *Titsingh* the honour of being the first, and he from *Kæmpfer* that of being the only *European* who by a long residence in *Japan*, and a familiar intercourse with the principal natives of it, has been able to collect authentic materials for the natural and civil history of a country *secluded*, (as the *Romans* used to say of our own island,) *from the rest of the world.* The works of those illustrious travellers will confirm and embellish each other; and when M. *Titsingh* shall have acquired a knowledge of *Chinese*, to which a part of his leisure in *Java* will be devoted, his precious collection of books in that language, on the laws and revolutions, the natural productions, the arts, manufactures, and sciences of *Japan*, will be in his hands an inexhaustible mine of new and important information. Both he and his predecessor assert with confidence, and, I doubt not, with truth, that the *Japanese* would resent, as an insult on their dignity, the bare suggestion of their descent from the *Chinese*, whom they surpass in several of the mechanical arts, and, what is of greater consequence, in military spirit ; but they do not, I understand, mean to deny that they are a branch of the same ancient stem with the people of *China ;* and, were that fact ever so warmly contested by them, it might be proved by an invincible argument, if the preceding part of this discourse, on the origin of the *Chinese*, be thought to contain just reasoning. In the first place, it seems inconceivable that the *Japanese*, who never appear to have been conquerors or conquered, should have adopted the whole system of *Chinese* literature with all its inconveniences and intricacies, if an immemorial connexion had not subsisted between the two nations, or, in other words, if the bold and ingenious race who peopled *Japan* in the middle of the thirteenth century before *Christ*,and, about six hundred years afterwards established their monarchy, had not carried with them the letters and learning which they and the *Chinese* had possessed in common ; but my principal argument is, that the *Hindu* or *Egyptian* idolatry has prevailed in *Japan* from the earliest ages ; and among the idols worshipped, according to *Kæmpfer*, in that country before the innovations of *Sácya* or *Buddha*, whom the *Japanese* also called *Amida*, we find many of those which we see every day in the temples of *Bengal ;* particularly *the goddess with many arms*, representing the powers of nature ; in *Egypt* named *Isis*, and there *Isáni* or *Isí ;* whose image, as it is exhibited by the *German* traveller, all the *Bráhmans* to whom I showed it, immediately recognized with a mixture of pleasure and enthusiasm.—It is very true that the *Chinese* differ widely from the natives of *Japan* in their vernacular dialects, in external manners, and perhaps in the strength of their mental faculties ; but as wide a difference is observable among all the nations of the *Gothic* family ; and we might account even for a greater dissimilarity, by considering the number of ages during which the several swarms have been separated from the great *Indian* hive, to which they primarily belonged. The modern *Japanese* have *Kæmpfer* the idea of polished *Tartars ;* and it is reasonable to believe that the people of *Japan*, who were originally *Hindus* of the martial class, and advanced farther eastward than the *Chínas*, have, like them, insensibly changed their features and characters by intermarriages with various *Tartarian* tribes, whom they found loosely scattered over their isles, or who afterwards fixed their abode in them.

Having now shown in five discourses, that the *Arabs* and *Tartars* were originally distinct races, while the *Hindus*, *Chinese*, and *Japanese* proceeded from another ancient stem, and that all the three stems may be traced to *Iràn*, as to a common centre, from which it is highly probable that they diverged in various directions about four thousand years ago, I may seem to have accomplished my design of investigating the origin of the *Asiatic* nations ; but the questions which I undertook to discuss, are not yet ripe for a strict analytical argument ; and it will first be necessary to examine with scrupulous attention all the detached or insulated races of men, who either inhabit the borders of *India*, *Arabia*, *Tartary*, *Persia*, and *China*, or are interspersed in the mountainous and uncultivated parts of those extensive regions. To this examination I shall, at our next annual meeting, allot an entire discourse ; and if, after all our inquiries, no more than *three* primitive races can be found, it will be a subsequent consideration whether those three stocks had one common root ; and, if they had, by what means that root was preserved amid the violent shocks which our whole globe appears evidently to have sustained.

XXVI.

The TRANSLATION *of an* INSCRIPTION *in the* MAGA LANGUAGE *engraved on a* SILVER PLATE, *found in a* CAVE *near* ISLA'MABA'D.—*Communicated by* JOHN SHORE *Esq.*

ON the 14th *Mágha 904*, *Chándi Láh Rájà**, by the advice of *Bowangari Rauli*, who was the director of his studies and devotions, and in conformity to the sentiments of twenty-eight other *Raulis*, formed the design of establishing a place of religious worship ; for which purpose a cave was dug, and paved with bricks, three cubits in depth, and three cubits also in diameter ; in which were deposited one hundred and twenty brazen images of small dimensions denominated *Tahmúdas ;* also, twenty brazen images larger than the former, denominated *Lángúda ;* there was likewise a large image of stone call *Lángúdagári*, with a vessel of brass, in which were deposited two of the bones of *T'hácur*. On a silver plate were inscribed the *Hauca*, or the mandates of the deity ; with that also styled *Taumah Chucksowna Tahma*, to the study of which twenty-eight *Raulis* devote their time and attention ; who, having celebrated the present work of devotion with festivals and rejoicings, erected over the cave a place of religious worship for the *Magas*, in honour of the deity.

God sent into the world *Buddha Avatár* to instruct and direct the steps of angels and of men ; of whose birth and origin the following is a relation :—When *Buddha Avatár* descended from the region of souls, in the month of *Mágh*, and entered the body of *Mahámáyà*, the wife of *Sootah Dannah*, *Rájà* of *Cailàs*, her womb suddenly assumed the appearance of clear transparent crystal, in which *Buddha* appeared, beautiful as a flower, kneeling and reclining on his hands. After ten months and ten days of her pregnancy had elapsed, *Mahámáyà* solicited permission from her husband, the *Rájà*, to visit her father : in conformity to which the roads were directed to be repaired and made clear for her journey; fruit-trees were planted, water-vessels placed on the road-side, and great illuminations prepared for the occasion. *Mahámáya'* then commenced her journey, and arrived at a garden adjoining to the road, where inclination led her to walk and gather flowers. At this time, being suddenly attacked with the pains of child-birth, she laid hold on the trees for support, which declined their boughs at the instant, for the purpose of concealing her person, while she was delivered of the child; at which juncture *Brahmá* himself attended with a golden vessel in his hand, on which he laid the child, and delivered it to *Indra*, by whom it was committed to the charge of a female attendant; upon which the child, alighting from her arms, walked seven paces, whence it was taken up by *Mahámáya'* and carried to her house, and, on the ensuing morning, news were circulated of a child being born in the *Rája's* family. At this time *Tapaswi Muni*, who, residing in the woods, devoted his time to the worship of the deity, learned by inspiration that *Buddha* was come to life in the *Rája's* palace: he flew through the air to the *Rája's* residence, where, sitting on a throne, he said, "I have repaired hither "for the purpose of visiting the child." *Buddha* was accordingly brought into his presence: the *Muni* observed two feet fixed on his head, and, divining something both of good and bad import, began to weep and laugh alternately. The *Rája* then questioned him with regard to his present impulse, to whom he answered, "I must "not reside in the same place with *Buddha* when he shall arrive at "the rank of *Avatár*: this is the cause of my present affliction; but "I am even now affected with gladness by his presence, as I am "hereby absolved from all my transgressions." The *Muni* then departed; and, after five days had elapsed, he assembled four *Pandits* for the purpose of calculating the destiny of the child; three of whom divined, that, as he had marks on his hands resembling a wheel, he would at length become a *Rája' Chacraverti*; another divined, that he would arrive at the dignity of *Avatár*.

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* Perhaps *Sándilyah*.

The boy was now named *Sácya*, and had attained the age of sixteen years; at which period it happened that the *Rája Chuhiddn* had a daughter named *Vasutárá*, whom he had engaged not to give in marriage to any one, till such time as a suitor should be found who could brace a certain bow in his possession, which hitherto many *Rájàs* had attempted to accomplish without effect. *Sácya* now succeeded in the attempt, and accordingly obtained the *Rájà's* daughter in marriage, with whom he repaired to his own place of residence.

One day, as certain mysteries were revealed to him, he formed the design of relinquishing his dominion ; at which time a son was born in his house, whose name was *Raghu*. *Sácya* then left his palace with only one attendant and a horse, and, having crossed the river *Gangá*, arrived at *Balúcáli*, where, having directed his servant to leave him and carry away his horse, he laid aside his armour.

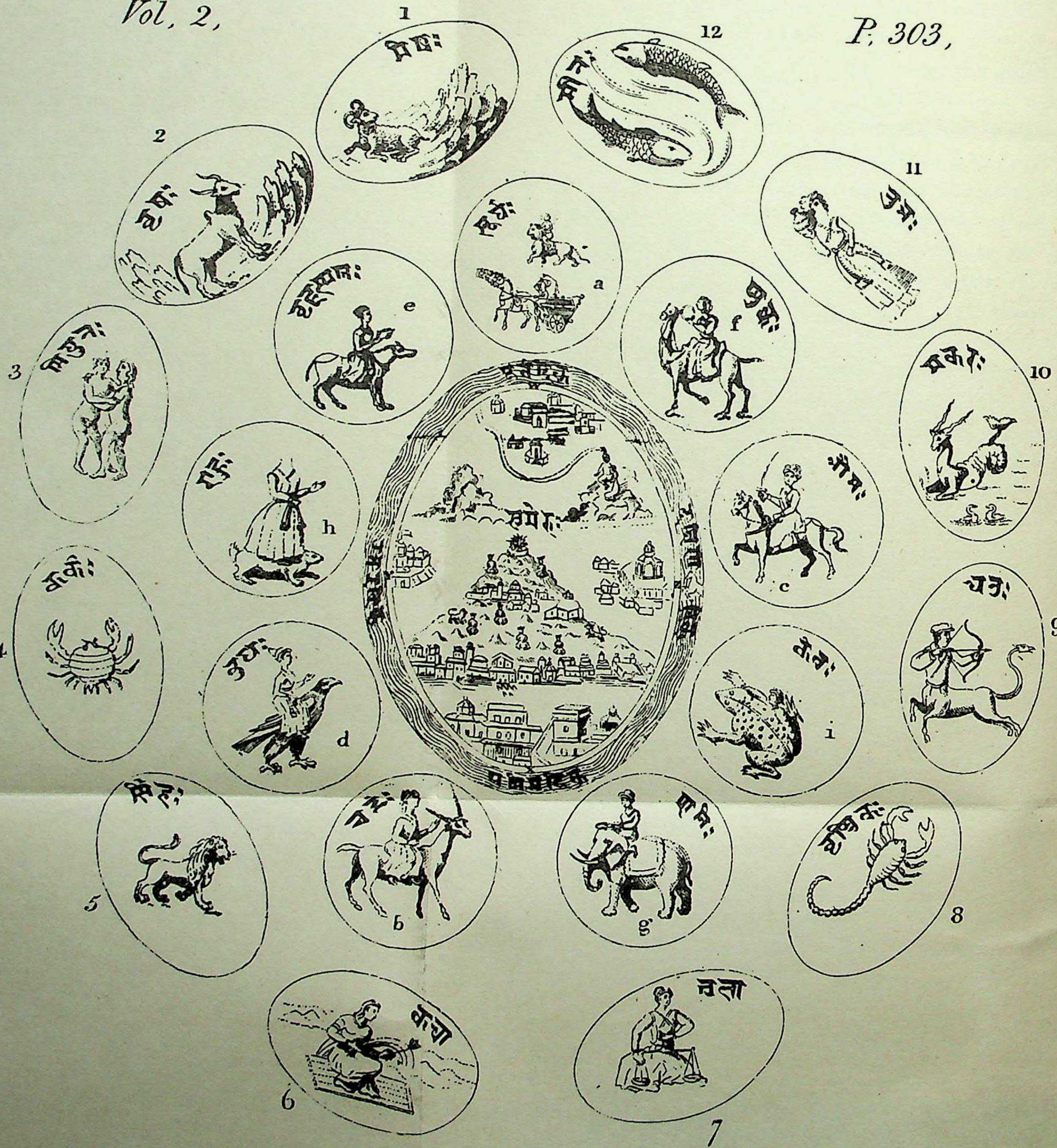
When the world was created, there appeared five flowers, which *Brahmá* deposited in a place of safety ; three of them were afterwards delivered to the three *T'hácurs*, and one was presented to *Sácya*, who discovered, that it contained some pieces of wearing apparel, in which he clothed himself, and adopted the manners and life of a mendicant. A traveller one day passed by him with eight bundles of grass on his shoulders, and adressed him, saying, "a "long period of time has elapsed since I have seen the *T'hácur ;* "but now since I have the happiness to meet him, I beg to present "him an offering, consisting of these bundles of grass." *Sácya* accordingly accepted of the grass, and reposed on it. At that time there suddenly appeared a golden temple, containing a chair of wrought gold ; and the height of the temple was thirty cubits, upon which *Brahmá* alighted, and held a canopy over the head of *Sácya :* at the same time *Indra* descended, with a large fan in his hand, and *Nága*, the *Rájà* of serpents, with shoes in his hand, together with the four tutelar deities of the four corners of the universe ; who all attended to do him service and reverence. At this time likewise the chief of *Asurs* with his forces arrived, riding on an elephant, to give battle to *Sácya*, upon which *Brahmá*, *Indra*, and the other deities deserted him and vanished. *Sácya*, observing that he was left alone, invoked the assistance of the Earth ; who attending at his summons, brought an inundation over all the ground, whereby the *Asur* and his forces were vanquished, and compelled to retire.

At this time five holy scriptures descended from above, and *Sácya* was dignified with the title of *Buddha Avatár*. The scriptures confer powers of knowledge and retrospection, the ability of accomplishing the impulses of the heart, and of carrying into effect the words of the mouth. *Sácya* resided here, without breaking his fast, twenty-one days, and then returned to his own country, where he presides over *Rájàs*, governing them with care and equity.

Whoever reads the *Cáric*, his body, apparel, and the place of his devotions must be purified; he shall be thereby delivered from the evil machinations of demons and of his enemies; and the ways of redemption shall be open to him. *Buddha Avatár* instructed a certain *Rauli*, by name *Anguli Málà*, in the writings of the *Cáric*, saying, "whoever shall read and study them, his soul shall not undergo a transmigration:" and the scriptures were thence called *Anguli Málà*. There were likewise five other books of the *Cáric*, denominated *Vachanam*, which if any one peruse, he shall thereby be exempted from poverty and the machinations of his enemies; he shall also be exalted to dignity and honours, and the length of his days shall be protracted. The study of the *Cáric* heals afflictions and pains of the body; and whoever shall have faith therein, heaven and bliss shall be the reward of his piety.

ORIENTAL ZODIAC.

Vol, 2, *P. 303,*


1
मेष:
2
वृष:
3
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4
कर्कि:
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कन्या
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वृश्चिक:
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मकर:
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कुम्भ:
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From 1 to 12 are the 12 Signs. a The Sun. b The Moon. c Mars. d Mercury. e Jupiter. f Venus. g Saturn. h Dragons Head or Aſsending Node. i Dragons Tail or Descending Node. The center is the Earth surrounded by the Sea. mark'd with the four Cardinal Points E.W.N.S. W.X.Y.Z.

XXVII.

A Supplement *to the* Essay *on* Indian Chronology.

By the President.

OUR ingenious associate Mr. *Samuel Davis* (whom I name with respect and applause, and who will soon, I trust, convince M. *Bailly* that it is very possible for an *European* to translate and explain the *Súrya Siddhánta)* favoured me lately with a copy, taken by his *Pandit*, of the original passage, mentioned in his paper on the Astronomical Computations of the *Hindus* concerning the places of the colures in the time of *Varáha*, compared with their position in the age of a certain *Muni*, or ancient *Indian* philosopher; and the passage appears to afford evidence of two actual observations, which will ascertain the chronology of the *Hindus*, if not by rigorous demonstration, at least by a near approach to it.

The copy of the *Váráhisanhità*, from which the three pages received by me had been transcribed, is unhappily so incorrect (if the transcript itself was not hastily made) that every line of it must be disfigured by some gross error; and my *Pandit*, who examined the passage carefully at his own house, gave it up as inexplicable; so that, if I had not studied the system of *Sanscrit* prosody, I should have laid it aside in despair: but though it was written as prose, without any sort of distinction or punctuation, yet, when I read it aloud, my ear caught, in some sentences, the cadence of verse, and of a particular metre, called *A'ryà*, which is regulated (not by the *number* of syllables, like other *Indian* measures, but) by the proportion of *times*, or *syllabic moments*, in the four divisions of which every stanza consists. By numbering the moments and fixing their proportion, I was enabled to restore the text of *Varáha*, with the perfect assent of the learned *Bráhmen* who attends me; and, with his assistance, I also corrected the comment, written by *Bhattótpala*, who, it seems, was a son of the author, together with three curious passages, which are cited in it. Another *Pandit* afterwards brought me a copy of the whole original work, which confirmed my conjectural emendations, except in two immaterial syllables, and except that the first of the six couplets in the text is quoted in the commentary from a different work, entitled *Panchasiddhánticà*, five of them were composed by *Varáha* himself; and the third chapter of his treatise begins with them.

Before I produce the original verses, it may be useful to give you an idea of the *A'ryà* measure, which will appear more distinctly in *Latin* than in any modern language of *Europe* :

Tigridas, apros, thoas, tyrannos, pessima monstra, venemur :
Dic hinnulus, dic lepus male quid egerint graminivori.

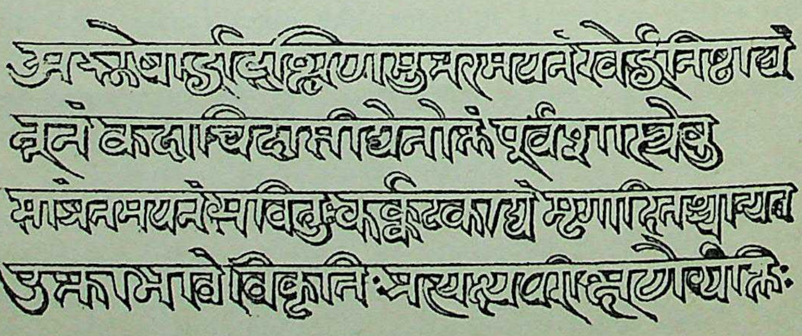
The couplet might be so arranged as to begin and end with the cadence of an hexameter and pentameter, six *moments* being interposed in the middle of the long, and seven in that of the short, hemistich :

Thoas, apros, tigridas nos *venemur*, pejoresque tyrannos :
Dic tibi cerva, lepus *tibi dic male quid* egerit herbivorus.

Since the *A'ryà* measure, however, may be almost infinitely varied, the couplet would have a form completely *Roman*, if the proportion of *syllabic instants*, in the long and short verses, were *twenty-four* to *twenty*, instead of *thirty* to *twenty-seven* :

Venor apros tigridasque, et, pessima monstra, tyrannos :
Cerva mali quid agunt herbivorusque lepus ?

I now exhibit the five stanzas of *Varáha* in *European* characters, with an etching of the two first, which are the most important, in the original *Dévanágarì* :



आश्लेषार्द्धाद्दक्षिणमुत्तरमयनं रवेर्द्धनिष्ठाद्यं
नूनं कदाचिदासीद्येनोक्तं पूर्वशास्त्रेषु
साम्प्रतमयनं सवितुः कर्कटकाद्यं मृगादितश्चान्यत्
उक्ताभावो विकृतिः प्रत्यक्षपरीक्षणैर्व्यक्तिः

Aśléshárdháddacshinamuttaramayanaṅ ravérdhanish't'hádyan.
Núnaṅ cadáchidásídyénóctaṅ púrva śastréshu.
Sámpratamayanaṅ savituh carcátacádyaṅ mrĭgáditaśchányat :
Uctábhávè vicrĭtih pratyacshaperícshanair vyactih.
Dúrast'hachihnavédyádudayé'stamayé'pivà sahasráṅsóh,
Ch'háyápravéśanĭrgamachihnairvà maṅdálè mahatí.
Aprápya macaramarcò vinivrĭttò haṅti sáparáṅ yámyáṅ,
Carcátacamasaṅpráptò vinivrĭttaśchóttarán saindríṅ.
Uttaramayanamatítya vyávrĭttah cshémaśasya vrĭddhicarah,
Pracrĭtist'haśchápyévaṅ vicrĭtigatir bhayacridushnáṅśuh.

Of the five couplets thus exhibited, the following translation is most scrupulously literal :

"Certainly the southern solstice was once in the middle of "*Aśléshà ;* the northern in the first *degree* of *Dhanisht'hà*, by what "*is* recorded in former *Sástras.* At present, one solstice is in the "first *degree* of *Carcata*, and the other in the first of *Macara**. That "which *is* recorded not appearing, a change *must have happened ;* "*and* the proof arises from ocular demonstrations ; *that is,* by "observing the remote object and its marks at the rising or setting "of the sun, or by the marks in a large *graduated* circle, of the "shadow's ingress and egress. The sun, by turning back without "having reached *Macara*, destroys the south and the west ; by turning back without having reached *Carcata*, the north and east. "By returning when he has just passed the winter solstitial "point, he makes wealth secure and grain abundant, since he moves thus according to nature ; but the sun, by moving unna-"turally, excites terror."

Now the *Hindu* astronomers agree, that the 1st of *January* 1790, was in the year 4891 of the *Caliyuga*, or their *fourth* period ; at the beginning of which, they say, the equinoctial points were in the first degrees of *Méshá* and *Tulá* ; but they are also of opinion, that the vernal equinox oscillates from the third of *Mína* to the twenty-seventh of *Mésha*, and back again in 7200 years, which they divide into four *pádas*, and consequently that it moves in the two intermediate *pádas* from the first to the twenty-seventh of *Mésha* and back again in 3600 years ; the colure cutting their ecliptic in the first of *Mésha*, which coincides with the first of *Aswinì*, at the beginning of every such oscillatory period. *Varáha*, surnamed *Mihira*, or the Sun, from his knowledge of astronomy, and usually distinguished by the title of *Achárya*, or teacher of the *Véda*, lived, confessedly, when the *Caliyuga* was far advanced ; and, since by actual observation he found the solstitial points in the first degrees of *Carcata* and *Macara*, the equinoctial points were at the same time in the first of *Mésha* and *Tulà* : he lived, therefore, in the year 3600 of the fourth *Indian* period, or 1291 years before the 1st of *January* 1790, that is, about the year 499 of our era. This date corresponds with the *ayanánsa*, or precession, calculated by the rule of the *Súrya Siddhánta* ; for 19° 21′ 54″ would be the precession of the equinox in 1291 years, according to the *Hindu* computation of 54″ annually, which gives us the origin of the *Indian* Zodiac nearly ; but, by *Newton's* demonstrations, which agree as well with the phenomena as the varying density of our earth will admit, the equinox recedes about 50″ every year, and has receded 17° 55′ 50″ since the time of *Varáha* ; which gives us more nearly in our own sphere the first degree of *Mesha* in that of the *Hindus*. By the observation recorded in older *Sástras*, the equinox had gone back 23° 20′ ; or about 1680 years had intervened between the age of the *Muni* and that of the modern astronomer : the former observation, therefore, must have been made about 2971 years before the 1st of *January* 1790 ; that is, 1181 before *Christ*.

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* We quote the following lines from the Third Volume of Asiatic Researches, Page 208 of the Original Work :--

"NOTE *on* Vol. II. *page* 391.—By the PRESIDENT.—A desire of translating the couplets of VARA'HAMIHIRA with minute exactness, and of avoiding the *Sanscrit* word *ayana* in an *English* phrase, has occasioned a little inaccuracy, or at least ambiguity, in the version of two very important lines, which may easily be corrected by twice reading *ádyát* in the *fifth* case for *ádyam* in the first : so that they may thus be translated word for word : "Certainly the "southern road of the sun was, *or began,* once from the middle of *Asléshà ;* the northern, "from the first of *Dhanisht'hà.* At present the *southern* road of the sun *begins* from the "first of *Carcata ;* and the other from the first of *Mriga*, or *Matar.*"—*Publisher, Popular Edition.*

We come now to the commentary, which contains information of the greatest importance. By former *Sástras* are meant, says *Bhattótpala*, the books of *Parásara* and of other *Munis* ; and he then cites from the *Párásari Sanhitá* the following passage, which is in modulated prose, and in a style much resembling that of the *Védas* :

Sravishtádyát paushnárdhántan charah s'is'irò ; vasantah paushnárdhát róhinyántaǹ ; saumyádyádas'léshárdhántaǹ gríshmah;

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právrĭdas'léshárdhát hastántan; chitrádyát jyésh't'hárdhántań s'arat; hémantò jyésh't'hardhát vaishn'avántań.

"The season of *Sis'ira* is from the first of *Dhanisht'ha`* to "the middle of *Révatì;* that of *Vasanta* from the middle of *Révatì* "to the end of *Róhiṇì;* that of *Grishma* from the beginning of "*Mrĭgaśiras* to the middle of *Aśléshà;* that of *Versha`* from the "middle of *As'lésha`* to the end of *Hasta;* that of *Sarad* from the "first of *Chitra`* to the middle of *Jyésht'ha`;* that of *Hémanta* from "the middle of *Jyésht'ha`* to the end of *Sravanà.*"

This account of the six *Indian* seasons, each of which is co-extensive with two signs, or four lunar stations and a half, places the solstitial points, as *Varáha* has asserted, in the first degree of *Dhanisht'ha`*, and the middle, or 6° 40′, of *Aślésha`*, while the equinoctial points were in the *tenth* degree of *Bharanì* and 3° 20′ of *Vis'ác'ha`;* but, in the time of *Varáha*, the solstitial colure passed through the 10th degree of *Punarvasu* and 3° 20′ of *Uttaráshára`*, while the equinoctial colure cut the *Hindu* ecliptic in the first of *Aswinì* and 6° 40′ of *Chitrà*, or the *Yóga* and only star of that mansion, which, by the way, is indubitably the *Spike* of the Virgin, from the known longitude of which all other points in the *Indian* Zodiac may be computed. It cannot escape notice, that *Parásara* does not use in this passage the phrase *at present*, which occurs in the text of *Varáha;* so that the places of the colures might have been ascertained *before* his time, and a considerable change might have happened in their true position without any change in the phrases by which the seasons were distinguished; as our popular language in astronomy remains unaltered, though the Zodiacal asterisms are now removed a whole sign from the places where they have left their names. It is manifest, nevertheless, that *Parásara* must have written *within twelve centuries* before the beginning of our era, and that single fact, as we shall presently show, leads to very momentous consequences in regard to the system of *Indian* history and literature.

On the comparison which might easily be made between the colures of *Parásar* and those ascribed by *Eudoxus* to *Chiron*, the supposed assistant and instructor of the *Argonauts*, I shall say very little; because the whole *Argonautic* story, (which neither was, according to *Herodotus*, nor, indeed, could have been originally

Grecian) appears, even when stripped of its poetical and fabulous ornaments, extremely disputable; and whether it was founded on a league of the *Helladian* princes and states for the purpose of checking, on a favourable opportunity, the overgrown power of *Egypt*, or with a view to secure the commerce of the *Euxine* and appropriate the wealth of *Colchis;* or, as I am disposed to believe, on an emigration from *Africa* and *Asia* of that adventurous race, who had first been established in *Chaldea;* whatever, in short, gave rise to the fable, which the old poets have so richly embellished, and the old historians have so inconsiderately adopted, it seems to me very clear, even on the principles of *Newton*, and on the same authorities to which he refers, that the voyage of the *Argonauts* must have preceded the year in which his calculations led him to place it. *Battus* built *Cyrene*, says our great philosopher, on the site of *Irasa*, the city of *Antæus*, in the year 633 before *Christ;* yet he soon afterwards calls *Euripylus*, with whom the *Argonauts* had a conference, king of *Cyrene;* and in both passages he cites *Pindar*, whom I acknowledge to have been the most learned, as well as the sublimest, of poets. Now, if I understand *Pindar* (which I will not assert, and I neither possess nor remember at present the *Scholia*, which I formerly perused) the fourth *Pythian* Ode begins with a short panegyric on *Arcesilas* of *Cyrene;* "Where," says the bard, "the priestess, who sat "near the golden eagles of *Jove*, prophesied of old, when *Apollo* was "not absent from his mansion, that *Battus*, the colonizer of fruitful "*Lybia*, having just left the sacred isle *(Thera)* should build a city "excelling in cars, on the splendid breast of earth, and, *with the* "*seventeenth generation*, should refer to himself the *Therean* predic"tion of *Medea* which that princess of the *Colchians*, that impe"tuous daughter of *Æetes*, breathed from her immortal mouth, "and thus delivered to the half-divine mariners of the warrior "*Jason*." From this introduction to the noblest and most animated of the *Argonautic* poems, it appears, that *fifteen complete generations* had intervened between the voyage of *Jason* and the emigration of *Battus;* so that, considering *three* generations as equal to *an hundred* or *an hundred and twenty* years, which *Newton* admits to be the *Grecian* mode of computing them, we must also place that voyage at least *five* or *six hundred* years before the time fixed by *Newton* himself, according to his own computation, for the building of *Cyrene;*

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that is, *eleven* or *twelve hundred and thirty-three* years before *Christ:* an age very near on a medium to that of *Parásara.* If the poet means afterwards to say, as I understand him, that *Arcesilas*, his contemporary, was the *eighth* in descent from *Battus*, we shall draw nearly the same conclusion, without having recourse to the unnatural reckoning of *thirty-three* or *forty* years to a generation; for *Pindar* was forty years old when the *Persians*, having crossed the *Hellespont*, were nobly resisted at *Thermopylæ*, and gloriously defeated at *Salamis.* He was born, therefore, about the sixty-fifth *Olympiad*, or five hundred and twenty years before our era; so that, by allowing more naturally *six* or *seven hundred* years to *twenty-three* generations, we may at a medium place the voyage of *Jason* about one thousand one hundred and seventy years before our Saviour, or about *forty-five* years before the beginning of the *Newtonian* chronology.

The description of the old colures by *Eudoxus*, if we implicity rely on his testimony and on that of *Hipparchus*, who was, indisputably, a great astronomer for the age in which he lived, affords, I allow, sufficient evidence of some rude observation about 937 years before the *Christian* epoch; and, if the cardinal points had receded from those colures 36° 29′ 10″ at the beginning of the year 1690, and 37° 52′ 30″ on the first of *January* in the present year, they must have gone back 3° 23′ 20″ between the observation implied by *Parásar* and that recorded by *Eudoxus;* or, in other words, 224 years must have elapsed between the two observations But this disquisition having little relation to our principal subject, I proceed to the last couplets of our *Indian* astronomer *Varáha Mihira*, which, though merely astrological, and consequently absurd, will give occasion to remarks of no small importance. They imply, that when the solstices are not in the first degrees of *Carcata* and *Macara*, the motion of the sun is contrary to nature; and being caused, as the commentator intimates, by some *utpáta*, or preternatural agency, must necessarily be productive of misfortune; and this vain idea seems to indicate a very superficial knowledge even of the system which *Varáha* undertook to explain; but he might have adopted it solely as a religious tenet, on the authority of *Garga*, a priest of eminent sanctity, who expresses the same wild notion in the following couplet:

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Yadà nivertatè'práptah sravishtámuttaráyanè,
Asléshán dacshiné'práptastadàvidyànmahadbhayan.

"When *the sun* returns, not having reached *Dhanisht'hà* in the "northern solstice, *or* not having reached *Asléshà* in the southern, "then let *a man* feel great apprehension of danger."

Parásara himself entertained a similar opinion, that any irregularity in the solstices would indicate approaching calamity: *Yadà-práptò vaishnavántam*, says he, *udanmárgè prepadyatè, dacshiné asléshám và mahábhayáya*, that is, "When, having reached the end of *Sravanà*, in the northern path, or half of *Asléshà* in the southern, "he still advances, *it is* a cause of great fear." This notion, possibly, had its rise before the regular precession of the cardinal points had been observed; but we may also remark that some of the lunar mansions were considered as inauspicious, and others as fortunate; thus *Menu*, the first *Indian* lawgiver, ordains, that certain rites shall be performed under the influence of a happy *Nacshatra;* and, where he forbids any female name to be taken from a constellation, the most learned commentator gives *A'rdrà* and *Révatì* as examples of ill-omened names, appearing by design to skip over others that must first have occurred to him. Whether *Dhanisht'hà* and *Asléshà* were inauspicious or prosperous, I have not learned; but, whatever might be the ground of *Varáha's* astrological rule, we may collect from his astronomy, which was grounded on observation, that the solstice had receded *at least* 23° 20′ between his time and that of *Parásara;* for, though he refers its position to the *signs*, instead of the *lunar mansions*. yet all the *Pandits*, with whom I have conversed on the subject, unanimously assert, that the first degrees of *Mésha* and *Aswinì* are coincident. Since the two ancient sages name only the lunar asterisms, it is probable, that the solar division of the Zodiac into twelve signs was not generally used in their days; and we know from the comment of the *Súrya Siddhánta*. that the lunar month, by which all religious ceremonies are still regulated, was in use before the solar. When *M. Bailly* asks, "Why the "*Hindus* established the beginning of the precession, according to "their ideas of it, in the year of *Christ* 499?" to which his calculations also had led him, we answer, because *in that year* the vernal equinox was found by observation in the origin of their ecliptic;

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and since they were of opinion that it must have had the same position in the first year of the *Caliyuga*, they were induced by their erroneous theory to fix the beginning of their fourth period 3600 years before the time of *Varáha*, and to account for *Parásara's* observation, by supposing an *utpáta*, or *prodigy*.

To what purpose, it may be asked, have we ascertained the age of the *Munis?* Who was *Parásara?* Who was *Garga?* With whom were they contemporary, or with whose age may theirs be compared? What light will these inquires throw on the history of *India* or of mankind? I am happy in being able to answer those questions with confidence and precision.

All the *Bráhmens* agree, that only one *Parásara* is named in their sacred records; that he composed the astronomical book before cited, and a law-tract, which is now in my possession; that he was the grandson of *Vasisht'ha*, another astronomer and legislator, whose works are still extent, and who was the preceptor of *Ráma*, king of *Ayódhya*; that he was the father of *Vyása*, by whom the *Védas* were arranged in the form which they now bear, and whom *Crishna* himself names with exalted praise in the *Gíta*; so that, by the admission of the *Pandits* themselves, we find only three generations between two of the *Rámas*, whom they consider as incarnate *portons* of the divinity; and *Parásara* might have lived till the beginning of the *Caliyuga*, which the mistaken doctrine of an oscillation in the cardinal points has compelled the *Hindus* to place 1920 years too early. This error, added to their fanciful arrangement of the four ages, has been the source of many absurdities; for they insist that *Válmic*, whom they cannot but allow to have been contemporary with *Rámachandra*, lived in the age of *Vyása*, who consulted him on the composition of the *Mahábhárat*, and who was personally known to *Balaráma*, the brother of *Crishna*. When a very learned *Bráhmen* had repeated to me an agreeable story of a conversation between *Válmic* and *Vyása*, I expressed my surprize at an interview between two bards, whose ages were separated by a period of 864,000 years; but he soon reconciled himself to so monstrous an anachronism, by observing that the longevity of the *Munis* was preternatural, and that no limit could be set to divine power. By the same recourse to miracles or to prophesy, he would have answered another objection equally fatal to his chronological system. It is agreed by all, that the lawyer *Yágyawalcya* was an attendant on the court of *Janaca*, whose daughter *Sítá* was the constant but unfortunate wife of the great *Ráma*, the hero of *Válmic's* poem; but that lawyer himself, at the very opening of his work, which now lies before me, names both *Parásara* and *Vyása* among twenty authors, whose tracts form the body of original *Indian* law. By the way, since *Vasisht'ha* is more that once named in the *Mánavísanhita*', we may be certain that the laws ascribed to *Menu*, in whatever age they might have been first promulgated, could not have received the form in which we now see them, above *three thousand* years ago. The age and functions of *Garga* lead to consequences yet more interesting: he was confessedly the *purôhita*, or officiating priest, of *Crishna* himself, who, when only a herdsman's boy at *Mat'hurà*, revealed his divine character to *Garga*, by running to him with more than mortal benignity on his countenance, when the priest had invoked *Náráyan*. His daughter was eminent for her piety and her learning, and the *Bráhmans* admit, without considering the consequence of their admission, that she is thus addressed in the *Véda* itself: *Yata u'rdhwaṅ nò và samópi, Gárgi, ésha áditye dyámúrdhànaṅ tapati, dyà và bhúmiṅ tapati, bhúmyà subhraṅ tapati, lócán tapati, antaraṅ tapatyanantaraṅ tapati*; or, "That Sun, "O daughter of *Garga*, than which nothing is higher, to which nothing is equal, enlightens the summit of the sky; with the sky "enlightens the earth; with the earth enlightens the lower worlds; "enlightens the higher worlds, enlightens other worlds; it enlightens the breast, enlightens all besides the breast." From these facts, which the *Bráhmans* cannot deny, and from these concessions, which they unanimously makes, we may reasonably infer, that, if *Vyása* was not the composer of the *Védas*, he added at least something of his own to the scattered fragments of a more ancient work, or perhaps to the loose traditions which he had collected; but whatever be the comparative antiquity of the *Hindu* scriptures, we may safely conclude that the *Mosaic* and *Indian* chronologies are perfectly consistent; that *Menu*, son of *Brahmá*, was the *Adima*, or *first*, created mortal, and consequently our *Adam*; that *Menu*, child of the Sun, was preserved with *seven* others, in a *bahitra* or capacious ark, from an universal deluge, and must therefore be our *Noah*; that *Hiranyacasipu*, the giant *with a golden axe*, and *Vali* or *Bali*, were impious and arrogant monarchs, and most probably our *Nimrod* and *Belus;* that the three *Rámas*, two of whom were invincible warriors, and the third not only valiant in war but the patron of agriculture and *wine*, which derives an epithet from his name, were different representations of the *Grecian Bacchus*, and either the *Ráma* of scripture, or his colony personified, or the Sun first adored by his idolatrous family; that a considerable emigration from *Chaldea* into *Greece*, *Italy*, and *India*, happened about *twelve* centuries before the birth of our Saviour; that *Sácya* or *Sisak*, about two hundred years after *Vyása*, either in person or by a colony from *Egypt*, imported into this country the mild heresy of the ancient *Bauddhas;* and that the dawn of true *Indian* history appears only three or four centuries before the *Christian* era, the preceding ages being clouded by allegory or fable.

As a specimen of that fabling and allegorizing spirit which has ever induced the *Bráhmens* to disguise their whole system of history, philosophy, and religion, I produce a passage from the *Bhágavat*, which, however strange and ridiculous, is very curious in itself, and closely connected with the subject of this essay. It is taken from the fifth *Scandha*, or section, which is written in modulated prose. " There are some," says the *Indian* author, " who, " for the purpose of meditating intensely on the holy son of *Vasu-* " *déva*, imagine you celestial sphere to represent the figure of that " aquatic animal which we call *Sis'umára:* its head being turned " downwards, and its body bent in a circle, they conceive *Dhruva*, " or the pole-star, to be fixed on the point of its tail; on the middle " part of the tail they see four stars, *Prejápati*, *Agni*, *Indra*, *Dherma*, " and on its base to others, *Dhátri* and *Vidhátrĭ:* on its rump are " the *Septarshis*, or seven stars of the *Sacata*, or *wain;* on its back " the path of the Sun, called *Ajavít'hì*, or the *Series of Kids;* on its " belly the *Gangà* of the sky: *Punarvasu* and *Pushya* gleam res- " pectively on its right and left haunches; *A'rdrà* and *Aslésà* on " its right and left feet, *or fins; Abhijit* and *Uttarásh'ád'ha* in its " right and left nostrils; *Sravanà* and *Purváshád'hà* in its right " and left eyes; *Dhanisht'hà* and *Múlà* on its right and left ears. " Eight constallations, belonging to the summer solstice, *Maghá*, " *Púrvap'halgunì*, *Uttarap'halgunì*, *Hasta*, *Chitrà*, *Swátì*, *Visác'hà*, " *Anurádhà*, may be conceived in the ribs of its left side; and as

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"many asterisms, connected with the winter solstice, *Mrigásiras*, "*Róhinì*, *Crittica'*, *Bharanì*, *Aswinì*, *Révatì*, *Uttarabhadrapada'*, *Pu'rvabhadrapada'*, may be imagined on the ribs of its right side in an "inverse order. Let *Satabhisha'* and *Jyésht'ha'* be placed on its right "and left shoulders. In its upper jaw is *Agastya*, in its lower *Yama*; "in its mouth the planet *Mangala*; in its part of generation, *Sanais'chara*; on its hump, *Vrihaspati*; in its breast, the Sun; in its heart, "*Náráyan*; in its front, the Moon; in its navel, *Uśanas*; on its two "nipples, the two *Aswinas*; in its ascending and descending breaths, "*Budha*; on its throat, *Ráhu*; in all its limbs, *Cétus*, or comets; "and in its hairs, or bristles, the whole multitude of stars." It is necessary to remark, that, although the *s'is'umára* be generally described as the *sea-hog* or *propoise*, which we frequently have seen playing in the *Ganges* yet *su'sma'r*, which seems derived from the *Sanscrit*, means in *Persian* a large *lizard*. The passage just exhibited may nevertheless relate to an animal of the cetaceous order, and possibly to the dolphin of the ancients. Before I leave the sphere of the *Hindus*, I cannot help mentioning a singular fact:—in the *Sanscrit* language *Ricsha* means a *constellation* and a *bear*, so that *Maharcsha* may denote either a *great bear* or a *great asterism*. Etymologists may, perhaps, derive the *Megas arctos* of the *Greeks* from an *Indian* compound ill understood; but I will only observe, with the wild *American*, that a bear *with a very long tail* could never have occurred to the imagination of any one who had seen the animal. I may be permitted to add, on the subject of the *Indian* Zodiac, that, if I have erred in a former essay, where the longitude of the lunar mansions is computed from the first star in our constellation of the Ram, I have been led into error by the very learned and ingenious M. *Bailly*, who relied, I presume, on the authority of M. *Le Gentil*. The origin of the *Hindu* Zodiac, according to the *Súrya Siddhánta*, must be nearly γ 19° 21′ 54″, in our sphere, and the longitude of *Chitra'*, or the Spike, must of course be 199° 21′ 54″ from the vernal equinox; but since it is difficult by that computation to arrange the twenty-seven mansions and their several stars, as they are delineated and enumerated in the *Retnamála'*, I must for the present suppose with M. *Bailly*, that the *Zodiac* of the *Hindus* had two origins, one constant and the other variable; and a farther inquiry into the subject must be reserved for a season of retirement and leisure.

XXVIII.

On the SPIKENARD *of the* ANCIENTS.

By the PRESIDENT.

IT is painful to meet perpetually with words that convey no distinct ideas; and a natural desire of avoiding that pain excites us often to make inquiries, the result of which can have no other use than to give us clear conceptions. Ignorance is to the mind what extreme darkness is to the nerves: both cause an uneasy sensation; and we naturally love knowledge as we love light, even when we have no design of applying either to a purpose essentially useful. This is intended as an apology for the pains which have been taken to procure a determinate answer to a question of no apparent utility, but which ought to be readily answered in *India*, " What is *Indian* " Spikenard?" All agree that it is an odoriferous plant, the best sort of which, according to *Ptolemy*, grew about *Rangamritica* or *Rangamáti*, and on the borders of the country now called *Buta'n*. It is mentioned by *Dioscorides*, whose work I have not in my possession; but his description of it must be very imperfect, since neither *Linnæus* nor any of his disciples pretend to class it with certainty; and, in the latest botanical work that we have received from *Europe*, it is marked as *unknown*. I had no doubt, before I was personally aquainted with *Koenig*, that he had ascertained it; but he assured me that he knew not what the *Greek* writers meant by the nard of *India*; he had found, indeed, and described a sixth species of the nardus, which is called *Indian* in the Supplement to *Linnæus*; but the *nardus* is a grass which, though it bear a *Spike*, no man ever supposed to be the *true* Spikenard, which the great Botanical Philosopher himself was inclined to think a species of *Andropogon*, and places in his *Materia Medica*, but with an expression of doubt, among his polygamous plants. Since the death of *Koenig* I have consulted every botanist and physician with whom I was acquainted, on the subject before us; but all have confessed without reserve, though not without some regret, that they were ignorant what was meant by the *Indian* Spikenard.

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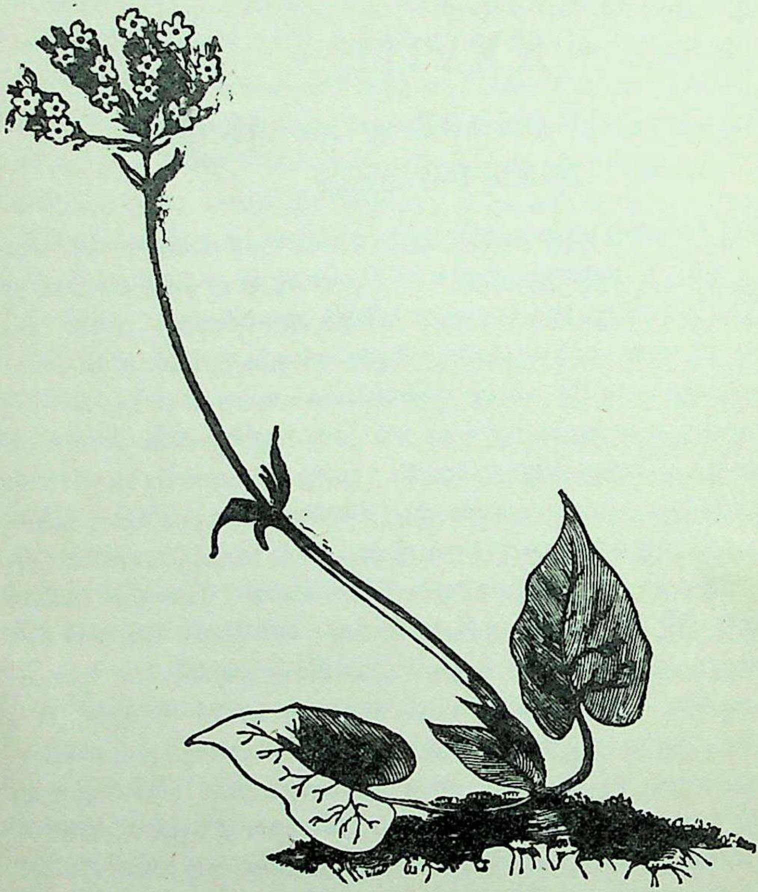

JATAMANSI.

or, The Indian Spikenard

In order to procure information from the learned natives, it was necessary to know the *name* of the plant in some *Asiatic* language. The very word *nard* occurs in the song of *Solomon*; but the name and the thing were both exotic : the *Hebrew* lexicographers imagine both to be *Indian*; but the word is in truth *Persian*, and occurs in the following distich of an old poet :

A′n chu bíkhest, ín chu nardest, án chu shákhest, ín chu bàr,
A′n chu bíkhì páyidárest, ín chu nardì páyidàr.

It is not easy to determine in this couplet, whether *nard* mean the *stem*, or, as *Anju'* explains it, the *pith ;* but it is manifestly a part of a vegetable, and neither the *root*, the *fruit*, nor the *branch*, which are all separately named. The *Arabs* have borrowed the word *nard* but in the sense, as we learn from the *Kámùs*, of a *compound medicinal unguent.* Whatever it signified in old *Persian*, the *Arabic* word *sumbul*, which, like *sumbalah*, means an *ear* or *spike*, has long been substituted for it ; and there can be no doubt that, by the *sumbul* of *India* the *Muselmáns* understand the same plant with the *nard* of *Ptolemy* and the *Nardostachys*, or *Spikenard*, of *Galen ;* who, by the way, was deceived by the dry specimens which he had seen, and mistook them for *roots*.

A singular description of the *sumbul* by *Abu'lfazl*, who frequently mentions it as an ingredient in *Indian* persumes, had for some time almost convinced me that the *true Spikenard* was the *Cétaca*, or *Pandanus* of our botanists : his words are, *Sumbul panjberg dáred, ceh dirázíi án dah angoshtestu pahnái, seh*, or, " The *sumbul* has five " leaves, ten fingers long, and three broad. " Now I well knew that the minister of *Acbar* was not a botanist, and might easily have mistaken a thyrsus for a single flower : I had seen no blossom, or assemblage of blossoms, of such dimensions, exept the male *Cétaca ;* and, though the *Persian* writer describes the female as a different plant, by the vulgar name *Cyóra*, yet such a mistake might naturally have been expected in such a work : but what most confirmed my opinion, was the exquisite fragrance of the *Cétaca*-flower, which to my sense far surpassed the richest perfumes of *Europe* or *Asia*. Scarce a doubt remained, when I met with a description of the *Cétaca* by *Forskohl*, whose words are so perfectly applicable to the general idea which we are apt to form of *Spikenard*, that I give you a literal translation of them : " The *Pandanus* is an incomparable plant, and " cultivated for its odour, which it breathes so richly, that one or " two *Spikes*, in a situation rather humid, would be sufficient to dif- " fuse an odoriferous air for a long time through a spacious apart- " ment ; so that the natives in general are not solicitous about the " living plants, but *purchase the Spikes at a great price.*" I learned also, that a fragrant essential oil was extracted from the flowers ; and I procured from *Banáres* a large phial of it, which was adulterated with sandal ; but the very adulteration convinced me, that the genuine essence must be valuable, from the great number of thyrsi that must be required in preparing a small quantity of it. Thus had I nearly persuaded myself, that the true nard was to be found on the banks of the *Ganges*, where the *Hindu* women roll up its flowers in their long black hair after bathing in the holy river; and I imagined, that the *precious alabaster-box* mentioned in the Scripture, and the *small onyx*, in exchange for which the poet offers to entertain his friends with *a cask of old wine*, contained an essence of the same kind, though differing in its degree of purity with the nard which I had procured; but an *Arab* or *Mecca*, who saw in my study some flowers of the *Cétaca*, informed me that the plant was extremely common in *Arabia*, where it was named *Cádhì;* and several *Mahomedans* of rank and learning have since assured me, that the true name of the *Indian Sumbul* was not *Cétaca*, but *Jatámánsì*. This was important information: finding, therefore, that the *Pandanus* was not peculiar to *Hindustán*, and considering that the *Sumbul* of *Abúlfazl* differed from it in the precise number of leaves on the thyrsus, in the colour, and in the season of flowering, though the length and breadth corresponded very nearly, I abandoned my first opinion, and began to inquire eagerly for the *Jatámánsì*, which grew, I was told, in the garden of a learned and ingenious friend, and fortunately was then in blossom. A fresh plant was very soon brought to me. It appeared on inspection to be a most elegant *Cypirus* with a polished three-sided culm, an umbella with three or four ensiform leaflets minutely serrated, naked proliferous peduncles, crowded spikes, expanded daggers; and its branchy root had a pungent taste with a faint aromatic odour; but no part of it bore the least resemblance to the drug known in *Europe* by the appelation of *Spikenard;* and a *Muselmán* physician from *Dehli* assured me positively, that the plant was not *Jatámánsì*, but *Sûd*, as it is named in *Arabic*, which the author of the *Tohfatu'l Múmenìn* particularly distinguishes from the *Indian Sumbul*. He produced on the next day an extract from the Dictionary of Natural History, to which he had referred; and I present you with a translation of all that is material in it.

" 1. *Sûd* has a roundish olive-shaped root, externally black, " but white internally, and so fragrant as to have obtained in *Persia* " the name of *Subterranean Musk:* its leaf has some resemblance

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"to that of a leek, but is longer and narrower, strong, somewhat "rough at the edges, and tapering to a point. 2. *Sumbul* means "a *spike* or *ear*, and was called *nard* by the *Greeks*. There are "three sorts of *Sumbul* or *Nardín;* but, when the word stands "alone, it means the *Sumbul* of *India*, which is an herb *without* "*flower or fruit* (he speaks of the drug only) like the tail of an er-"mine, or of a small weasel, but not quite so thick, and about the "length of a finger. It is darkish, inclining to yellow, and very "fragrant; it is brought from *Hindustán*, and its medicinal virtue lasts three years." It was easy to procure the dry *Jatámánsì*, which corresponded perfectly with the description of the *Sumbul;* and, though a native *Muselmán* afterwards gave me a *Persian* paper, written by himself, in which he represents the *Sumbul* of *India*, the *Sweet Sumbul*, and the *Jatámánsì* as three different plants, yet the authority of the *Tohfatu'l Múmenín* is decisive that the *Sweet Sumbul* is only another denomination of nard, and the physician who produced that authority, brought, as a specimen of *Sumbul*, the very same drug which my *Pandit*, who is also a physician, brought as a specimen of the *Jatámánsì*. A *Brahmen* of eminent learning gave me a parcel of the same sort, and told me that it was used in their sacrifices; that, when fresh, it was exquisitely sweet, and added much to the scent of rich essences, in which it was a principal ingredient; that the merchants brought it from the mountainous country to the north-east of *Bengal;* that it was the entire plant, not a part of it, and received its *Sanscrit* names from its resemblance to *locks of hair;* as it is called *Spikenard*, I suppose, from its resemblance to a spike when it is dried, and not from the configuration of its flowers, which the *Greeks*, probably, never examined. The *Persian* author describes the whole plant as resembling the tail of an ermine; and the *Jatámánsì*, which is manifestly the *Spikenara* of our druggists, has precisely that form, consisting of withered stalks and ribs of leaves, cohering in a bundle of yellowish brown capillary fibres, and constituting a spike about the size of a small finger. We may, on the whole, be assured, that the *nardus* of *Ptolemy*, the *Indian Sumbul* of the *Persians* and *Arabs*, the *Jatámánsì* of the *Hindus*, and the *Spikenard* of our shops, are one and the same plant; but to what class and genus it belongs in the *Linnean* system, can only be ascertained by an inspection of the fresh

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blossoms. Dr. *Patrick Russel,* who always communicates with obliging facility his extensive and accurate knowledge, informed me by letter, that " Spikenard is carried over the desert " (from *India,* I presume) " to *Allepo,* where it is used in substance, mixed with " other perfumes, and worn in small bags, or in the form of essence, " and kept in little boxes or phials, like *átar* of roses." He is persuaded, and so am I, that the *Indian* nard of the ancients and that of our shops, is one and the fame vegetable.

Though diligent researches have been made at my request on the borders of *Bengal* and *Behàr,* yet the *Jatámánsì* has not been found growing in any part of the *British* territories. Mr. *Saunders,* who met with it in *Bután,* where, as he was informed, it is very common, and whence it is brought in a dry state to *Rangpúr,* has no hesitation in pronouncing it a species of the *Baccharis ;* and, since it is not possible that he could mistake the *natural order* and *essential character* of the plant, which he examined, I had no doubt that the *Jatámánsì* was composit and corymbiferous with stamens connected by the anthers, and with female prolific florets, intermixed with hermaphrodites. The word *Spike* was not used by the ancients with botanical precision, and the *Stachys* itself is verticillated with only two species out of fifteen, that could justify its generic appellation. I therefore concluded that *the true Spikenard* was a *Baccharis,* and that, while the philosopher had been searching for it to no purpose,

> ——————the dull swain
> Trod on it daily with his clouted shoon ;

for the *Baccharis,* it seems, as well as the *Conyza,* is called by our gardeners, *Ploughman's Spikenard.* I suspected, nevertheless, that the plant which Mr. *Saunders* described was not *Jatámánsì ;* because I knew that the people of *Bután* had no such name for it, but distinguished it by very different names in different parts of their hilly country : I knew also that the *Butías,* who set a greater value on the drug than it seems, as a perfume, to merit, were extremely reserved in giving information concerning it, and might be tempted, by the narrow spirit of monopoly, to mislead an inquirer for the fresh plant. The friendly zeal of Mr. *Purling* will probably procure it in a state of vegetation ; for, when he had the kindness, at

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my desire, to make inquiries for it among the *Bután* merchants, they assured him, that the living plants could not be obtained without an order from their soverign the *Dévarájà*, to whom he immediately dispatched a messenger with an earnest request, that eight or ten of the growing plants might be sent to him at *Rangpùr*. Should the *Dévarájà* comply with that request, and should the vegetable flourish in the plain of *Bengal*, we shall have ocular proof of its class, order, genus, and species; and if it prove the same with the *Jatámánsi* of *Népàl*, which I now must introduce to your aquaintance, the question with which I began this essay will be satisfactorily answered.

Having traced the *Indian* Spikenard, by the name of *Jatámánsì*, to the mountains of *Népàl*, I requested my friend Mr. *Law*, who then resided at *Gayà*, to procure some of the recent plants by the means of the *Népálese* philgrims; who, being orthodox *Hindus*, and possessing many rare books in the *Sanscrit* language, were more likely than the *Butías* to know the true *Jatámánsì*, by which name they generally distinguish it. Many young plants were accordingly sent to *Gayà*, with a *Persian* letter specifically naming them, and apparently written by a man of rank and literature; so that no suspicion of deception or of error can be justly entertained. By a mistake of the gardener they were *all* planted at *Gayà*, where they have blossomed, and at first seemed to flourish. I must therefore, describe the *Jatámánsì* from the report of Mr. *Burt*, who favoured me with a drawing of it, and in whose accuracy we may perfectly confide; but, before I produce the description, I must endeavour to remove a prejudice, in regard to the *natural order* of the Spikenard, which they, who are addicted to swear by every word of their master *Linnæus*, will hardly abandon, and which I, who love truth better than him, have abandoned with some reluctance. *Nard* has been generally supposed to be a *grass;* and the word *stachys* or *spike*, which agrees with the habit of that natural order, gave rise, perhaps, to the supposition. There is a plant in *Java*, which most travellers and some physicians call *spikenard;* and the Governor of *Chinsura*, who is kindly endeavouring to procure it thence in a state fit for examination, writes me word, that "a *Dutch* author pronounces it a "*grass like the Cypirus*, but insists that what we call the *spike* is the "fibrous part above the root, as long as a man's little finger, of a

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"brownish hue inclining to red or yellow, rather fragrant, and with "a pungent, but aromatic scent." This is too slovenly a description to have been written by a botanist; yet I believe the latter part of it to be tolerably correct, and should imagine that the plant was the same with our *Jatámánsì*, if it were not commonly asserted that the *Javan* spikenard was used as a condiment; and if a well-informed man, who had seen it in the island, had not assured me that it was a sort of *Pimento*, and consequently a species of *Myrtle*, and of the order now called *Hesperian*. The resemblance before mentioned between the *Indin sumbul* and the *Arabian Sûd*, or *Cypirus*, had led me to suspect that the true nard was a *grass*, or a *reed*; and, as this country abounds in *odoriferous grasses*, I began to collect them from all quarters. Colonel *Kyd* obligingly sent me two plants with sweet-smelling roots; and, as they were known to the *Pandits*, I soon found their names in a *Sanscrit* dictionary: one of them is called *gàndhaśat'hì*, and used by the *Hindus* to scent the red powder of *Sapan*, or *Bakkam*-wood, which they scatter in the festival of the vernal season; the other has many names, and, among them, *nágaramastac* and *gónarda;* the second of which means *rustling in the water;* for all the *Pandits* insist that *nard* is never used as a noun in *Sanscrit*, and signifies, as the root of a verb, *to sound*, or *to rustle.* Soon after, Mr. *Burrow* brought me, from the banks of the *Ganges* near *Heridwàr*, a very fragrant grass, which in some places covers whole acres, and diffuses, when crushed, so strong an odour, that a person, he says, might easily have smelt it, as *Alexander* is reported to have smelt the nard of *Gedrosia* from the back of an elephant: its blossoms were not preserved, and it cannot, therefore, be described. From Mr. *Blane* of *Lucknow*, I received a fresh plant, which has not flowered at *Calcutta;* but I rely implicitly on his authority, and have no doubt that it is a species of *Andropogon:* it has rather a rank aromatic odour, and, from the virtue ascribed to it of curing intermittent fevers, is known by the *Sanscrit* name of *jwaráncus'a*, which literally means a *fever-hook*, and alludes to the *iron-hook* with which the elephants are managed. Lastly, Dr. *Anderson* of *Madras*, who delights in useful pursuits and in assisting the pursuits of others, favoured me with a complete specimen of the *Andropogon Nardus*, one of the most common grasses on the coast, and flourishing most luxuriantly on the mountains, never eaten by cattle, but extremely grateful to bees, and containing an essential oil, which, he understands, is extracted from it in many parts of *Hindustàn*, and used as an *âtar*, or *perfume*. He adds a very curious philological remark, that, in the *Tamul* dictionary, most words beginning with *nár* have some relation to *fragrance ;* as *nárukeradu* to yield an odour, *nártum pillu*, lemon-grass ; *nártei*, citron ; *nárta manum*, the wild orange-tree ; *nárum panei*, the *Indian Jasmin ; nárum alleri*, a strong smelling flower ; and *nártu*, which is put for *nard* in the *Tamul* version of our Scriptures ; so that not only the *nard* of the *Hebrews* and *Greeks*, but even the *copia narium* of *Horace*, may be derived from an *Indian* root. To this I can only say, that I have not met with any such root in *Sanscrit*, the oldest polished language of *India ;* and that in *Persian*, which has a manifest affinity with it, *nár* means a *pomegranate*, and *nárgìl* (a word originally *Sanscrit)* a *cocoa-nut ;* neither of which has any remarkable fragrance.

Such is the evidence in support of the opinion given by the great *Swedish* naturalist, that the true nard was a gramineous plant, and a species of *Andropogon ;* but since no grass, that I have yet seen, bears any resemblance to the *Jatámánsì*, which I conceive to be the *nardus* of the ancients, I beg leave to express my dissent, with some confidence as a philologer, though with humble diffidence as a student in botany. I am not, indeed, of opinion that the *nardum* of the *Romans* was merely the essential oil of the plant from which it was denominated, but am strongly inclined to believe that it was a *generic* word, meaning what we now call *âtar*, and either the *âtar* of roses from *Cashmír* and *Persia*, that of *Cétaca*, or *Pandanus*, from the western coast of *India*, or that of *Aguru*, or aloe-wood, from *Asám* or *Cochinchina*, the process of obtaining which is described by *Abúlfazl*, or the mixed perfume, called *âbír*, of which the principal ingredients were yellow sandal, violets, orange-flowers, wood of aloes, rose-water, musk, and true Spikenard : all those essences and compositions were costly ; and, most of them being sold by the *Indians* to the *Persians* and *Arabs*, from whom, in the time of *Octavius*, they were received by the *Syrians* and *Romans*, they must have been extremely dear at *Jerusalem* and at *Rome*. There might also have been a pure *nardine oil*, as *Athenæus* calls it ; but *nardum* probably meant (and *Koenig* was of the same opinion an *Indian* essence *in general*, taking its name from that ingredient which had, or was commonly thought to have, the most exquisite scent. But I have been drawn by a pleasing subject to a greater length than I expected, and proceed to the promised description of the *true nard*, or *Jatámánsì*, which, by the way, has other names in the *Amarcósh*, the smoothest of which are *jatilá* and *lómasà*, both derived from words meaning *hair*. Mr. *Burt*, after a modest apology for his imperfect aquaintance with the language of botanists, has favoured me with an account of the plant, on the correctness of which I have a perfect reliance, and from which I collect the following *natural characters :*

AGGREGATE.

Cal. Scarce any. *Margin*, hardly discernible.
Cor. One petal. *Tube* somewhat gibbous. *Border* five cleft.
Stam. Three *anthers.*
Pist. *Germ* beneath. One *style* errect.
Seed solitary, crowned with a pappus.
Root fibrous.
Leaves hearted, fourfold ; *radical* leaves petioled.

It appears, therefore, to be the *Protean* plant, *Valerian*, a sister of the mountain and *Celtic*, Nard, and of a species which I should describe in the *Linnæan* style, *Valeriana Jatámánsì floribus triandris, foliis cordatis quaternis, radicalibus petiolatis.* The radical leaves, rising from the ground and enfolding the young stem, are plucked up with a part of the root, and, being dried in the sun, or by an artificial heat, are sold as a drug, which from its appearance has been called *spikenard ;* though, as the *Persian* writer observes, it might be compared more properly to the *tail of an ermine.* When nothing remains but the dry fibres of the leaves, which retain their original form, they have some resemblance to a *lock of hair*, from which the *Sanscrit* name, it seems, is derived. Two mercantile agents from *Bután* on the part of the *Dévarája* were examined, at my request, by Mr. *Harington*, and informed him that the drug, which the *Bengalese* called *Jatámánsì*, "grew erect above the surface of the ground, "resembling in colour an ear of green wheat ; that, when recent, it "had a faint odour, which was greatly increased by the simple pro-

"cess of drying it; that it abounded on the hills, and even on the "plains, of *Bután*, where it was collected and prepared for medicinal purposes." What its virtues are, experience alone can ascertain; but, as far as botanical analogy can justify a conjecture, we may suppose them to be antispasmodic; and, in our provinces, especially in *Behàr*, the plant will probably flourish; so that we may always procure it in a state fit for experiment. On the description of the *Indian* Spikenard, compared with the drawing, I must observe, that, though all the leaves, as delineated, may not appear of the same shape, yet all of them are not fully expanded. Mr. *Burt* assures me that the four radical leaves are *hearted and petioled;* and it is most probable, that the cauline and floral leaves would have similar form in their state of perfect expansion; but, unfortunately, the plants at *Gayà* are now shrivelled; and they who seek farther information, must wait with patience, until new stems and leaves shall spring from the roots, or other plants shall be brought from *Népàl* and *Bután*. On the proposed inquiry into the virtues of this celebrated plant, I must be permitted to say, that, although many botanists may have wasted their time in enumerating the qualities of vegetables, without having ascertained them by repeated and satisfactory experiments, and although *mere botany* goes no farther than technical arrangement and description, yet it seems indubitable that the great end and aim of a botanical philosopher is to discover and prove the several uses of the vegetable system; and, while he admits with *Hippocrates the fallaciousness of experience*, to rely on experiment alone as the basis of his knowledge.

APPENDIX.

A

METEOROLOGICAL DIARY,

KEPT AT CALCUTTA,

BY

HENRY TRAIL, Esq

From 1st February 1784, to 31st December 1785.

REMARKS.

IN the following Diary of the Weather, begun the 1st of February 1784, every change in the air was marked down with the greatest precision three times every day, and always nearly at the same hours, viz. at sun-rising at three, or half past three o'clock in the afternoon, and at eleven o'clock at night.

While the wind continued southerly, the Thermometer was placed in a Verandah open to the Esplanade, where there was at all times a free circulation of air; and when the wind became northerly, the instrument was removed to the opposite side of the house, and equally exposed, as in the preceding part of the year.

The Barometer continued always in the same place.

The Hygrometer made use of, was a bit of fine sponge, suspended in a scale (on the end of a steel-yard) first prepared for more easily imbibing the moisture, by dipping it in a solution of Salt of Tartar, afterwards drying it well, and bringing it to an equilibrium by a weight in the opposite scale, at a time when the atmosphere appeared to have the least degree of moisture.

A semicircular scale at the top, divided from 0 to 90° on each side, with the needle of the yard, pointed out the quantity of moisture gained or lost daily; but in the following Diary the degrees of moisture have seldom been taken down.

Every fall of rain was likewise taken, and the quantity in cubic inches daily noted down.

The winds were also observed, and the figures 0, 1, 2, 3, 4, denote the force thereof.

Here it may be remarked, that at sun-rising, there is seldom or ever any wind; but no sooner is the air a little rarefied by its rays, than a little breeze begins, and this generally increases till about noon, when again it begins to lose its force, and dies away, from the same cause.

In order to ascertain the influence of the Moon upon the weather, the mean temperature, as well as the weight of the atmosphere of each quarter, is accurately marked down by taking in the three days preceding, and the three days after the change with the intermediate day. From these, the density is discovered, by the following rule given by Dr. *Bradley*, viz.

A, altitude of barometer; B, altitude of thermometer ; D density.

$$\frac{A}{B \times 350} = D - \text{or density.}$$

N. B. In this, the mean morning density is only taken. However, the mean density for the whole day may be found by the same rule.

January 1, 1785. From an examination of one year's observations on the influence of the Moon on the mercury in the Barometer, it does not appear that there is any certain rule to be laid down regarding it. However, it may be affirmed that the direction of the winds has more effect upon it, as we never fail to see the mercury highest when the wind blows from the NW ; in a lesser degree from the N, and lowest of all when it proceeds from the SE quarters.

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A GENERAL STATE *of the* WEATHER *for* FEBRUARY 1785.

	M.	N.	E.	
Greatest altitude of the Thermometer,	75°	86	76	74 2·3d Mean temperature.
Least ditto, ...	66	70	68	
Mean ditto, ...	74	79	73	

Clear, ...	3	days.
Cloudy, ...	26	do.
N° of days on which it rained,	8	do.
Quantity of rain, ...	4·2	Inch.

This month the wind very variable, and the atmosphere for the most part cloudy, and sometimes several days succeeding without any sun ; the air also damp and cold. Frequently thunder, and on the 8th there was a fall of hail in the afternoon, accompanied with thunder.

The mornings generally foggy.

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CALCUTTA, FEBRUARY 1784.

Days.	Thermometer.			Mean morning density of each quarter of the Moon.	Rain Inch.	Wind.		Appearance of the air.	REMARKS.
	M.	N.	E.			Points.	Force.		
1	68	75	72			W	0	Cloudy,	Sunday.
2	58	78	72			N	0	ditto,	Heavy, with a great appearance of rain.
3	67	74	69	Full Moon 70 3-7ths		NE	0	ditto,	ditto.
4	68	77	68			S	0	ditto,	ditto.
5	71	79	72			SW	1	ditto,	ditto.
6	72	80	74			NW	1	ditto,	A thick fog all day.
7	71	82	75			S	2	Clear,	
8	70	80	74		1.		1	Cloudy,	Some hail in the afternoon, with thunder.
9	74	80	75				2	ditto,	
10	75	80	74				2	ditto,	A great appearance of rain, very dark.
11	71	77	75	L. Q. 71 6-7ths			1	ditto,	
12	73	79	76		.2	NW	1	ditto,	ditto, a few drops of rain.
13	73	80	74		.1	S	3	ditto,	ditto.
14	74	80	75		.1	NW	2	ditto,	ditto.
15	70	82	72				1	ditto,	Much thunder this morning, with a heavy shower.
16	72	78	74		0.5	S	2	ditto,	
17	70	81	72				0	Clear,	
18	69	76	72	New Moon 70 3-7ths		var.	1	Hazy,	
19	69	79	74			S	0	ditto,	A few drops of rain.
20	70	77	75			W	2	ditto,	
21	73	77	74				1	Cloudy,	Very gloomy, and a great appearance of rain, very close, no sun all day.
22	70	75	73			N	0	Hazy,	
23	70	83	75			W	0	ditto,	
24	72	84	74				0	Cloudy,	ditto.
25	71	76	73		0.5		1	ditto,	Clear at intervals.
26	68	70	68		.2		0	ditto,	ditto.
27	67	74	69	F. Q. 67 2-7ths		NW	0	ditto,	Very thick.
28	67	79	71		.1	W	1	ditto,	Thunder, very moist and wet.
29	66	78	71			NW	2	Clear,	Very chilly.
mean	72	79	73		4.2	var.	2	Cloudy,	Mean state of the atmosphere.

A GENERAL STATE *of the* WEATHER *for* MARCH.

	M.	N.	E.	
Greatest altitune of Thermometer,	84	89	85	79 1-3d Mean temperature.
Least ditto, ...	66	75	71	
Mean ditto, ...	75	84	79	

Clear, ...	16	days.
Cloudy, ...	15	do.
Rain, ...	3	do.
Quantity of do.	1·8	inch.

The wind almost continually southerly, and strong blasts towards the end of the month ; the weather throughout clear and serene, and heavy dews at night ; which indeed must always be the case when they are preceded by a clear warm sun.

In blowing weather dews are seldom seen, the moisture as it falls being dispelled by the wind.

The heat of the earth this month about mid-day, about 120°.

CALCUTTA, MARCH 1784.

Days.	Thermometer.			Mean morning heat at each quarter of the Moon.	Rain. Inch.	Wind.		Appearance of the air.	REMARKS.
	M.	N.	E.			Points.	Force.		
1	66	80	71			SW	1	Clear,	Monday.
2	67	80	71			W	1	ditto,	Moist.
3	70	82	76			S	2	ditto,	Thunder, but no rain.
4	72	85	75		1	W	4	Cloudy,	Thunder, early this morning.
5	73	84	74			SE	0	Hazy,	
6	71	83	74				2	Cloudy,	
7	70	78	74	Full Moon 70 5-7ths			1	ditto,	Great appearance of rain.
8	69	75	74			S	1	Clear,	
9	70	80	74				1	ditto,	The weather very fine and dry.
10	70	82	75				0	ditto,	ditto.
11	70	83	75			var.	2	ditto,	ditto.
12	69	85	75				1	ditto,	ditto.
13	70	88	79			S	3	ditto,	ditto.
14	75	86	81	L. Q. 73 6-7ths.			1	ditto,	The morning foggy.
15	76	86	80				0	Cloudy,	Very close and sultry.
16	79	86	81				0	Clear,	ditto.
17	78	86	81				0	ditto,	ditto.
18	79	87	83			var.	0	Hazy,	ditto.
19	80	88	83				3	Clear,	The wind high.
20	80	86	82		0.3		3	Cloudy,	ditto, thunder.
21	77	85	83	New Moon 79 3-7ths		W	3	ditto,	ditto.
22	80	86	83			S	2	Clear,	
23	80	88	84				0	Cloudy,	Mbist.
24	80	89	83				1	ditto,	ditto.
25	81	88	85				1	ditto,	Very thick.
26	83	89	84			var.	1	ditto,	A great appearance of rain.
27	84	86	80		0.5	S	4	ditto,	The wind boisterous.
28	77	82	81	F. Q. 80 2-7ths			3	ditto,	ditto.
29	78	81	81				2	ditto,	ditto.
30	79	86	83				1	Clear,	
31	80	84	81				1	ditto,	
mean	75	84	79		1.8	S	3	Clear.	Mean state of the atmosphere.

A GENERAL STATE *of the* WEATHER *for* APRIL.

	M.	N.	E.	
Greatest altitude of the Thermometer,	86	97	87	86 1-3d Mean temperature.
Least ditto, ...	71	87	79	
Mean ditto, ...	83	91	85	

Clear, ...	14	days.
Cloudy, ...	16	do.
Rain, ...	6	do.
Quantity of do.	3-1	inch.

The prevailing wind this month, as well as the former, south ; the mean heat of the earth at mid-day, 126°. Blowing and heavy weather in general, and frequent thunder-storms about the end, although many of the nights were close and sultry.

The thunder-storms that generally prevail at this time of the year, always happen in the afternoon of evening, and come from the NW, and are attended with loud peals and heavy falls of rain. Before these storms begin, the clouds become very dark and low ; and the winds being thus confined between the clouds and earth, must of course, be greatly augmented.

Calcutta, April 1784.

Days.	Thermometer.			Mean morning heat at each quarter of the Moon.	Rain.	Wind.		Appearance of the air.	Remarks.
	M.	N.	E.			Point.	Force.		
1	79	89	85			S	1	Clear,	Thursday.
2	81	87	83				0	ditto,	
3	81	91	85	Full Moon 82 6-7ths			4	Cloudy,	Disagreeable blowing weather.
4	83	89	85				3	ditto,	ditto.
5	83	89	86				3	ditto,	ditto
6	83	88	85				4	Cloudy,	ditto.
7	83	91	86				3	Hazy,	ditto.
8	83	91	85				2	Clear,	
9	84	92	86				1	ditto,	
10	84	94	87	L. Q. 84 3-7ths			0	ditto,	
11	85	97	87				0	ditto,	
12	86	95	87				0	ditto,	The night very close.
13	85	93	85				0	ditto,	ditto.
14	86	92	83			SE	3	ditto,	Hard blowing weather with much dust.
15	83	91	85			S	3	Cloudy,	
16	83	90	86		0.4		3	ditto,	ditto
17	84	89	80	New Moon 81 3-7ths	1.5		4	ditto,	A heavy thunder-storm in the evening.
18	80	88	79		0.5	SW	2	ditto,	
19	74	87	85			NW	3	ditto,	High wind.
20	83	90	85			S	0	Clear,	Very close.
21	83	91	86				3	ditto,	Strong wind.
22	83	92	85				3	ditto,	ditto.
23	83	93	87				0	Hazy,	Close and sultry.
24	83	92	86	F. Q. 83 2-7ths			3	Clear,	
25	84	90	86				3	ditto,	
26	84	89	84		0.4		4	Cloudy	With rain and thunder.
27	80	88	85		0.2		4	ditto,	ditto, from NW.
28	83	90	86				2	ditto,	ditto. ditto.
29	85	88	85		0.1		0	ditto,	ditto.
30	84	89	85				3	ditto,	High wind.
mean	83	91	85		3.1	S	4	Cloudy,	Mean state of the atmosphere.

A GENERAL STATE *of the* WEATHER *for* MAY.

	M.	N.	E.	
Greatest altitude of the Thermometer,	85	93	88	84 2-3ds Mean temperature.
Least ditto, ...	75	82	74	
Mean ditto, ...	81	89	84	

Clear, ...	7	days.
Cloudy, ...	24	do.
Rain, ...	14	do.
Quantity of do	.9-6	inches.

The wind southerly, with a few pretty violent storms from the NW, at the beginning of the month, while the latter part was close, gloomy, and warm ; but in general, the whole month was exceedingly cloudy, and scarcely a single day of bright sun-shine.

The rains began on the 22d, and from that day to the end, the nights were very close and sultry, and the air very damp.

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Calcutta, May 1784.

Days.	Thermometer.			Mean morning heat of each quarter of the Moon.	Rain.	Wind.		Appearance of the air.	Remarks.
	M.	N.	E,			Point.	Force.		
1	82	86	82		2.	S	3	Cloudy,	Saturday, a violent storm.
2	77	88	74	Full Moon 79 6-7ths	1.		3	ditto,	Very heavy do. No sun.
3	75	82	79		0.6		4	ditto,	ditto.
4	78	87	84				1	Hazy,	And close.
5	82	89	84				1	ditto,	No sun all day.
6	81	90	85		0.5		2	ditto,	A thunder storm in the evening.
7	84	90	85				3	ditto,	High wind at times.
8	82	90	86				3	Clear,	ditto.
9	83	90	87	L. Q. 79 6-7ths			2	Hazy,	
10	84	90	87		0.4		3	Cloudy,	Very thick and dark.
11	85	89	78			SE	2	ditto,	
12	75	88	84		0.8	E	2	ditto,	A thunder-storm in the evening.
13	77	85	80		2.	S	1	ditto,	
14	75	85	83			var.	0	ditto,	No wind.
15	80	88	84			S	0	Clear,	
16	80	90	83	New Moon 82 6-7ths	0.2		1	ditto,	Thunder in the evening,
17	78	91	86				0	ditto,	The weather very close and still.
18	83	91	87				0	ditto,	ditto.
19	84	90	87				1	ditto,	ditto.
20	85	92	87				1	Cloudy,	At intervals.
21	85	93	88				0	Clear,	Very still.
22	85	91	85		0.6		2	Cloudy,	Thunder in the evening.
23	84	90	83		0.4		2	ditto,	ditto.
24	82	89	85	F. Q. 81 6-7ths			2	ditto,	ditto.
25	83	92	86		0.2		1	ditto,	ditto.
26	84	86	84		0.1		2	ditto,	ditto.
27	81	82	83		0.2	SE	2	ditto,	ditto.
28	80	86	83			NW	3	ditto,	A great appearance of rain.
29	81	89	84		0.4	NW	2	ditto,	The nights very sultry.
30	82	89	85			NW	3	ditto,	ditto.
31	83	92	36		0.2	S	2	ditto,	Thunder. do.
mean	81	89	84		9.6	S	2	Cloudy,	Mean state of the atmosphere.

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A GENERAL STATE *of the* WEATHER *for* JUNE.

	M.	N.	E.	
Greatest altitude of the Thermometer,	84	90	86	83 Mean temperature.
Least ditto, ...	77	80	78	
Mean ditto, ...	81	85	83	

Clear, ...	1	days.
Cloudy, ...	29	do.
Rain,	14	do.
Quantity of do. ...	17·4	Inches.

The wind, this month, inclining sometimes to the E of S. The atmosphere exceedingly moist and wet, and much rain from the 10th to 17th, the sky mostly clouded throughout, and very little variation in the temperature of the air.

CALCUTTA, JUNE 1784.

Days.	Thermometer.			Mean heat of each quarter of the Moon.	Rain.	Wind.		Appearance of the air.	REMARKS
	M.	N.	E.			Points.	Force.		
1	82	82	82	Full Moon 81 3-7ths	0.7	S	1	Cloudy,	TUESDAY, thunder.
2	80	86	84		1.2		1	ditto,	
3	82	84	83				1	ditto,	
4	82	85	82		0.2		1	ditto,	A gentle shower.
5	81	87	85			var.	0	ditto,	Close.
6	82	90	85				0	ditto,	
7	83	85	84	L. Q. 80 1-7ths	0.5		1	ditto,	
8	81	84	82		1.6	NE	1	ditto,	Several showers.
9	80	84	83				0	ditto,	
10	81	83	82		1.1		0	ditto,	No sun all day.
11	79	80	80		1.6	S	1	ditto,	Incessant rain all day.
12	78	78	78		4.6		3	ditto,	ditto
13	77	80	80		0.1		1	ditto,	
14	80	85	80		0.4		2	ditto,	Thunder in the evening.
15	81	85	82	New Moon 81 1-7ths	0.1	W	2	Hazy,	No sun all day.
16	80	82	79		2,5	var.	1	Cloudy,	ditto.
17	80	83	83		0.8	S	0	ditto,	ditto.
18	81	89	85				1	Hazy,	ditto.
19	81	88	85				1	ditto,	Sun very faint.
20	82	88	86				1	ditto,	Very thick, and no sun.
21	84	90	85			SE	1	ditto,	The night very close.
22	84	88	85			SE	1	ditto,	ditto.
23	82	88	85	F. Q. 82			1	ditto,	ditto.
24	82	90	84				1	ditto,	ditto.
25	83	90	86			var.	0	ditto,	ditto.
26	83	89	84			SE.	0	Cloudy,	ditto.
27	82	87	84			S	0	Hazy,	ditto.
28	83	87	83				0	Cloudy,	
29	81	81	81		2.1	var.	1	ditto,	Thunder.
30	81	88	83			S	3	Clear,	High wind.
mean	81	85	83		17.4	S&SE	1	Cloudy,	Mean state of the atmosphere.

A GENERAL STATE *of the* WEATHER *for* JULY.

	M.	N.	E.	
Greatest altitune of the Thermometer,	84	90	85	83 Mean temperature.
Least ditto, ...	77	77	78	
Mean ditto, ...	81	85	83	

Clear, ...	1	days.
Cloudy, ...	30	do.
Rain, ...	20	do.
Quantity of do.	15	inches.

The prevailing wind SE, and the atmosphere, as the former month, exceedingly thick and humid, and very little sun-shine. The mean temperature exactly the same as last month, and very little variation between the heat at mid-day and that of the morning and evening.

During the rains the wind is often variable, but commonly it comes round to the eastward, when there falls much rain.

CALCUTTA, JULY 1784.

Days.	Thermometer.			Mean morning heat of each quarter of the Moon.	Rain.	Wind.		Appearance of the air.	REMARKS.
	M.	N.	E.			Points.	Force.		
1	81	89	84	THURSDAY,		S	3	Clear,	The wind strong in the morning,
2	33	88	84				2	Cloudy,	but the nights very still and close.
3	83	83	83	Full Moon 82		SE	2	ditto,	
4	80	86	84				3	ditto,	
5	84	89	84				2	Hazy,	
6	84	88	84		0.4		1	Cloudy,	The night very bright.
7	83	85	84				0	ditto,	ditto thunder.
8	82	85	84		0.3		0	ditto,	ditto.
9	82	86	84	L. Q. 82 2-7ths	0.1		1	ditto,	ditto.
10	82	90	85		0.1		1	ditto,	Much lightning in the evening.
11	83	86	83		1.1	var.	1	ditto,	
12	82	86	84		0.9		1	ditto,	Several small showers.
13	83	86	84		0.3		2	ditto,	
14	81	84	82		0.2		1	ditto,	
15	79	83	82		2.6		1	ditto,	Rained all day.
16	82	83	82			SE	0	ditto,	
17	78	83	82	New Moon 79 5-7ths	0.9		1	ditto,	Small rain, very dark.
18	79	85	82		0.1		2	ditto,	On the 7th there had been no rain
19	79	84	82		0.1		1	ditto,	at Chunar, many persons sick,
20	80	85	81			S	3	ditto,	but chiefly among the Natives.
21	77	83	80		0.1	SE	1	ditto,	
22	79	84	82		0.3		1	ditto,	
23	80	85	79		1.7		0	ditto,	Much thunder and lightning.
24	79	83	80				1	ditto,	
25	79	83	81	F. Q. 79 6-7ths	0.1	E	1	ditto,	
26	80	86	82		0.1	SE	1	ditto,	Thunder.
27	81	86	83		0.2		1	ditto,	
28	81	86	84			SW	1	ditto,	
29	83	86	83			S	3	ditto,	High winds.
30	81	82	79		1.8	SW	1	ditto,	Thunder.
31	78	77	78		3.6		1	ditto,	Rain all day.
mean	81	85	83		15.	S&SE	1	Cloudy,	Mean state of the atmosphere.

A GENERAL STATE *of the* WEATHER *for* AUGUST.

		M.	N.	E.	
Thermometer,	Greatest altitude,	83°	89°	84°	82° 2-3ds Mean temperature.
	Least do. ...	77	80	80	
	Mean do. ...	81	85	82	
Barometer,	Gratest do. in. ...	29.75	29.75	29.76	Mean state of the atmosphere.—29.57.
	Least do. ...	29.57	29.56	29.61	
	Mean do. ...	29.67	29.66	29.70	
	Greatest variation, ...	.18	.19	15	
	Mean density ...	.688	.682	.688	.686 density.
Hygrometer,	Greatest moisture, ...	50°	45°	45°	
	Ditto drought, ...	15	10	10	
	Mean drought & moist.	3d 28m	1d 18m	1d 15m	

Clear, ...	5	days.
Cloudy, ...	26	do.
Rain, ...	23	do.
Quantity of do.	16-9	inches.

The air still very moist and very little sun-shine, although the nights in general were very bright and fine: frequently thunder, and on the 22d, an exceeding loud peal early in the morning. The quantity of rain that fell this month was very considerable, and every thing imbibing the moisture to the highest degree.

The Barometer is almost invariably higher at night than in the morning, and lowest always at mid-day. The air being much loaded with moisture the whole of this month, the variation of the mercury was very insensible. The same causes kept the Thermometer nearly stationary also.

CALCUTTA. AUGUST 1784.

Days.	Thermometer.			Mean density of each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N		E.			Point.	M.	N.	E.	
								d.	m.	d.	m.	d.	m.						
1	77	83	80	Full Moon SUNDAY.	29.64	29.64	29.73	10	15	10				1.2	S	0	1	0	Cloudy,
2	80	86	82		.65	.69	.73		15	5				0.4		0	1	0	ditto,
3	81	86	83		.76	.63	.70	15	20		20					1	1	1	ditto,
4	82	88	83		.66	.64	.66	15	25		20			0.4	SE	0	1	0	Clear,
5	82	86	83		.64	.63	.71	15	30		15			0.3	E	1	1	0	Cloudy,
6	81	86	83		.70	.70	.75	12	30	0	0			0.1	SE	1	1	1	ditto,
7	82	86	83	L. Q. 687	.75	.70	.74	10	40		5			0.2		0	1	0	ditto,
8	81	89	84		.74	.72	.72	10	35		10				S	1	2	1	Clear,
9	82	87	83		.70	.70	.73	15	35		30					0	0	0	ditto,
10	82	87	83		.73	.73	.75	40	40		30		30			1	0	1	ditto,
11	83	82	83		.72	.72	.73		40		40		40	0.4		1	2	0	Cloudy,
12	82	83	81		.70	.72	.74		45	2			8	0.7	SE	1	2	0	ditto,
13	81	87	83		.72	.72	.76		15	10			10			0	1	1	ditto,
14	81	83	81		.73	.73	.77		20		20	10		0.8		1	1	0	ditto,
15	81	83	81		.74	.72	.74		10		35		25	0.7	S	0	0	0	ditto,
16	79	84	82	New Moon 689	.70	.60	.64		40		35		25	1.5	SE	1	0	0	ditto,
17	81	83	80		.60	.56	.61		25		40		30	2.5		1	1	0	ditto,
18	79	83	80		.58	.56	.64		45		30		40	2.8		0	2	1	ditto,
19	77	80	80		.65	.69	.74		45		45		30	0.8		1	1	1	ditto,
20	78	84	81		.74	.75	.72		40		35		45	0.5		1	2	2	ditto,
21	79	87	83		.72	.63	.69		50		15		35		SW	0	1	0	Clear,
22	80	86	83		.65	.64	.69		45		25		12	1.9		2	0	0	Hazy,
23	82	87	83	F. Q. 689	.67	.61	.67		30	0	0		20	0.2	S	0	0	0	Cloudy,
24	82	87	84		.64	.59	.66		30	0	0		5		SE	0	1	0	ditto,
25	83	86	84		.64	.64	.64		15	8			5	0.2	E	0	1	1	ditto,
26	81	85	81		.60	.56	.63		10		5	10		0.3	SE	2	2	1	ditto,
27	80	84	81		.6c	.59	.62		8		5		6	0.1		2	3	2	ditto,
28	80	85	83		.59	.64	.65		10		15		20	0.2		2	3	2	ditto,
29	81	87	83	Full Moon 688	.64	.68	.68		33	0	0		5	0.6	SW	3	3	3	ditto,
30	81	85	83		.66	.66	.69		20		15		10		SW	2	2	2	ditto,
31	80	84	83		.66	.69	.74		25		25		35	0.1	S	2	2	1	ditto,
mean	81	85	82		29.67	29.66	29.70	3	28	1	18	1	15	16.9	S & SE	1	1⅓	⅔	Cloudy.

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A GENERAL STATE *of the* WRATHER *for* SEPTEMBER.

		M.	N.	E.	
Thermometer,	Greatest altitude, ...	84°	90°	85°	82 1-3d Mean temperature.
	Least do. ...	76	77	78	
	Mean do. ...	80	85	81½	
Barometer,	Greatest do. in. ...	29.95	29.90	29.97	Mean state of the atmosphere.—29.81.
	Least do. ...	29.72	29.68	29.75	
	Mean do. ...	29.81	29.80	29.83	
	Greatest variation, ...	0.23	0.22	0.22	
	Mean density, ...	.693	.685	.692	690 density.
Hygrometer,	Greatest moisture, ...	60°	60°	60°	
	Ditto drought, ...	10	40	25	
	Mean density &moist.	½d 24m	10d 14m	5d 15m	

Clear, ...	10	days.
Cloudy. ...	20	do.
Rain. ...	12	do.
Quantity of do.	11-3	inches.

The wind generally S and SE, much lightning in the evenings, but not attended either with rain or thunder. The air still damp and cloudy, although the Barometer stood considerably higher than the preceding month.

It is worthy of observation, that upon the rains going off, the water falls in larger drops than at any other period of the season, and probably this may be occasioned from the height it has to fall: and in proof of this, the opposite stations of the Barometer need only be consulted, where it appears that the weight of the atmosphere was greatly increased about the last period of the rains.

CALCUTTA, SEPTEMBER 1784.

Days	Thermometer.			Mean density at each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	E.	
								d.	m.	d.	m.	d.	m						
1	81	86	83	WEDNESDAY.	29.72	29.72	29.79		40		5		20		S	0	1	1	Cloudy,
2	81	89	84		.79	.82	.84		25	5			5		SE	0	1	0	Clear,
3	83	83	82	L. Q. 691	.84	.81	.84		25		20		25	2.0	SW	0	1	0	Cloudy,
4	81	87	83		.82	.78	.76		35		20		15			1	1	1	Hazy,
5	81	88	83		.74	.78	.75		30		20		20			1	1	0	ditto,
6	82	89	83		.75	.77	.78		20		20		5			0	1	1	Cloudy,
7	81	89	83		.77	.82	.81		25	15	0		20		S	1	1	1	Clear,
8	81	88	83		.80	.83	.80		15	12		10			S	0	1	1	ditto,
9	82	89	84		.79	.72	.78		5	30		5			SW	0	2	0	ditto,
10	82	90	83		.76	.72	.78		5	35		20			SE	0	1	2	ditto,
11	84	90	85	New Moon 691	.78	.78	.81	10		40		25			NE	0	2	1	ditto,
12	84	87	84		.81	.80	.79		0	20		20		0.5		0	1	0	Cloudy &c
13	81	87	83		.77	.75	.76		25.	20		20			N	1	1	0	heavy,
14	82	84	82		.72	.68	.78		15	10		10			NE	1	1	1	ditto,
15	77	82	80		.77	.80	.80		15	0	0	0		0.7	SE	1	1	1	ditto,
16	79	81	81		.78	.80	.76		20		5		15	0.3		1	1	1	ditto,
17	79	80	79		.93	.70	.78		18		25		30	1.5		1	2	1	ditto,
18	77	81	78		.79	.77	.84		35		38		38	0.9		0	1	1	ditto,
19	76	77	78	F. Q. 698	.84	.89	.87		50		53		55	1.2		1	1	1	ditto,
20	78	80	79		.88	.89	.91		60		60		55	1.1		1	0	1	ditto,
21	78	80	78		.92	.89	.95		60		55		60	0.3	SE	1	1	1	ditto,
22	79	80	80		.95	.90	.97		60		45		45	1.1	E	1	0	0	ditto,
23	78	83	80		.94	.88	.92		45		30		35	0.1	SE	0	1	0	ditto,
24	79	84	80		.92	.84	.88		40		20		30		S	0	1	0	ditto,
25	79	85	80		.88	.84	.86		35		0		5		SE	0	1	0	ditto,
26	78	86	82	Full Moon 694	.87	.84	.86		20	20		5			SE	0	1	1	Clear,
27	80	83	79		.80	.84	.80		5		0	5		1.6	var.	0	2	1	Cloudy,
28	79	85	82		.80	.77	.83		15	20		5			S	0	2	1	Clear,
29	80	88	84		.84	.81	.89		10	35		20			SE	0	1	1	ditto,
30	83	89	83		.89	.87	.93	5		35		15				0	1	0	ditto.
mean	80	85	81½		29.81	29.80	29.83	½	24	10	14	5	15	11.3	SE & S	½	1	⅔	Cloudy.

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A General State *of the* Weather *for* October.

		M.	N.	E.	
Thermometer,	Greatest altitude,	83	90	85	82½ Mean temperature.
	Least do. ...	74	77	76	
	Mean do. ...	79	86½	82½	
Barometer,	Greatest do. in. ...	30.04	30.00	30.02	Mean state of the atmosphere.—29.91.
	Least do. ...	29.74	29.77	29.76	
	Mean do. ...	29.92	29.91	29.92	
	Greatest variation, ...	0.30	0.23	0.26	
	Mean density, ...	.697	.686	.693	.692 density.
Hygrometer,	Greatest moisture, ...	48	25	30	
	Ditto drought, ...	30	50	45	
	Mean moist & drought	5d 7m	30d 1m	22d 2m	

Clear,	...	19 days.
Cloudy,	...	12 do.
Rain,		3 do.
Quantity of do.	...	0-8 Inches.

The air very clear and elastic, and heavy dews at night. The Barometer very high, and the wind W and NW.

About the middle of the month the mornings became a little foggy, which indicates the approach, or beginning, of the cold season:-the atmosphere thin and dry, and cleared of its vapours; of course the mercury rose in the Barometer.

As the difference between the day and the night heat begins now to be greater than in any of the eight preceding months, the fogs we have at this season of the year are by that means formed.

CALCUTTA, OCTOBER 1784.

Days.	Thermometer.			Mean density of each quarter of the Moon.	Barometer.			Hygrometer.						Rain	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	E.	
								d.	m.	d,	m.	d.	m.						
1	83	89	82	FRIDAY.	29.91	29.93	29.93	3		35		10		0.6	SE	0	3	1	Cloudy,
2	81	82	80		.94	.90	.92		10	15		10		0.1	S	1	3	1	ditto,
3	80	85	83		.90	.83	.87		15	15		5			SE	0	1	1	ditto,
4	80	88	84		.83	.77	.86		15	25		15			S	0	2	0	ditto,
5	82	88	84		.78	.78	.78		5	25		15			NE	0	3	0	ditto,
6	81	90	83	L. Q. 692	.76	.78	.76		0	20		15		0.1	var.	0	1	1	Clear,
7	82	87	82		.74	.77	.77	5		20		15				0	1	1	ditto,
8	82	88	83		.77	.77	.83	5		40		35			W	0	1	0	Cloudy,
9	80	89	82		.83	.87	.86	10		40		35			W	1	1	0	Clear,
10	79	89	82		.88	.87	.86	15		40		35				0	1	0	ditto,
11	99	90	83		30.03	.96	30.	15		40		30				0	1	1	ditto,
12	81	88	85		29.98	.94	29.97		25	25		15				0	2	0	ditto,
13	81	89	85		.99	.92	.94		10	25		15				0	1	1	ditto,
14	80	89	84	New Moon 696	.93	.89	.92			30		15				0	1	0	ditto,
15	80	87	82		.92	.92	.91		10	40		20				0	1	0	ditto,
16	79	89	83		.91	.93	.93		10	35		30			SW	0	1	0	ditto,
17	78	88	83		.94	30.	.94		0	35		30			SW	0	1	0	ditto,
18	80	87	83		.94	29.97	.96		0	35		30			W	0	1	0	ditto,
19	80	89	83		30.02	.98	30.01		0	40		25			NW	0	1	0	ditto,
20	77	88	82		.04	.98	29.98	10		45		30				0	1	0	ditto,
21	78	88	82		29.98	.96	.99	20		50		45				0	1	0	ditto,
22	78	87	83	F. Q. 702	30.	.99	.98	30		50		40				0	1	0	Cloudy,
23	77	80	76		29.95	.94	.93	10		0			30	0.05		1	2	1	ditto,
24	75	77	76		.88	.89	.92		40		25		25		N	3	3	0	ditto,
25	74	84	79		.92	.88	.93		35	5			5		NW	1	1	0	ditto,
26	76	83	80		.93	.90	.92		20	15		10				1	1	0	ditto,
27	76	86	80		.92	.89	.94		5	30		20				1	1	1	ditto,
28	75	86	80	Full Moon 705	.94	.94	.99		0	40		35				1	1	0	Clear,
29	76	83	80		.99	30.	.99	10		35		30				0	1	0	ditto,
30	75	85	80		.98	29.95	30.	10		40		40				0	2	0	ditto,
31	75	85	80		30	30.	30.02	20		45		40				0	1	0	ditto.
mean	79	86½	82½		29.29	29.91	29.92	5	7	30	1	22	2	0.8	WNW	⅓	1½	⅓	Clear.

A GENERAL STATE *of the* WEATHER *for* NOVEMBER.

		M.	N.	E.	
Thermometer,	Greatest altitude, ...	78°	86	80	76 Mean temperature.
	Least do. ...	66	76	71	
	Mean do. ...	$71\frac{1}{2}$	$80\frac{2}{3}$	$75\frac{1}{2}$	
Barometer,	Greatest do. in. ...	30.12	30.05	30.08	30.00 mean state of the atmosphere.
	Least do. ...	29.60	29.88	29.92	
	Mean do. ...	30.00	29.99	30.02	
	Greatest variation, ...	00.52	00.17	00.16	
	Mean density, ...	.712	.696	.706	702 density.
Hygrometer,	Greatest moisture, ...	40	15	15	
	Ditto drought, ...	45	55	50	
	Mean moist& drought,	8m 10d	$\frac{1}{2}$m 35d	1m 28d	

Clear, ... 23 days.
Cloudy, ... 7 do.
Rain, ... 1 do.
Quantity of do. 0·9 inches.

The NW winds prevailed this month ; but nothing remarkable in the changes of the atmosphere, although there were several appearances of rain in the course of it. The air more elastic than any of the former months, also more serene and dry. The foggy mornings still keep off.

In clear dry weather there is always a very sensible change on the Barometer two or three hours after sun-rising ; it being often near one-tenth of an inch higher about nine o'clock than at six, or sunrise. May not this be owing to the load of vapour condensed and kept near the surface of the earth from the coldness of the night, which, as it is gradually rarefied by the heat of the sun, must increase the weight and spring of the atmosphere, and produce this variation ? From hence, the Barometer is always higher in the evening before these watery particles fall than in the morning when the air is replete.

A GENERAL STATE *of the* WEATHER *for* NOVEMBER.

		M.	N.	E.	
Thermometer,	Greatest altitude, ...	78°	86	80	76 Mean temperature.
	Least do. ...	66	76	71	
	Mean do. ...	$71\frac{1}{2}$	$80\frac{2}{3}$	$75\frac{1}{2}$	
Barometer,	Greatest do. in. ...	30.12	30.05	30.08	30.00 mean state of the atmosphere.
	Least do. ...	29.60	29.88	29.92	
	Mean do. ...	30.00	29.99	30.02	
	Greatest variation, ...	00.52	00.17	00.16	
	Mean density, ...	.712	.696	.706	702 density.
Hygrometer,	Greatest moisture, ...	40	15	15	
	Ditto drought, ...	45	55	50	
	Mean moist& drought,	8m 10d	$\frac{1}{2}$m 35d	1m 28d	

Clear, ...	23	days.
Cloudy, ...	7	do.
Rain, ...	1	do.
Quantity of do.	0-9	inches.

The NW winds prevailed this month ; but nothing remarkable in the changes of the atmosphere, although there were several appearances of rain in the course of it. The air more elastic than any of the former months, also more serene and dry. The foggy mornings still keep off.

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ABSTRACT *of a* METEOROLOGICAL REGISTER, *kept at* Calcutta, 1784.

MONTH	THERMOMETER.									Difference between morn. & mid-day heat	BAROMETER.												Mean state atmosphere.			Moisture.			Appearance atmosphere.		Thunder No. times.	Winds.	
	Morning.			Noon.			Evening.				Morning.				Noon.				Evening.														
	Lowest.	Highest.	Mean.	Lowest.	Highest.	Mean	Lowest.	Highest.	Mean.		Lowest.	Highest.	Mean.	Variation.	Lowest.	Highest.	Mean.	Variation.	Lowest.	Highest.	Mean.	Variation.	Temperature.	Weight.	Density.	Moisture.	Rainy days.	Quant. rain.	Number clear days.	Cloudy do.		Point.	Force.
February,	66	75	72	70	86	79	68	76	73	7													$74\frac{2}{3}$		700	6	8	4.2	3	26	6	S	2
March,	66	84	75	75	89	84	71	85	79	9													$79\frac{1}{3}$		692	5	3	1.8	16	15	3	S	3
April,	71	86	83	87	97	91	79	87	85	8													$86\frac{1}{3}$		681	10	6	3.1	14	16	6	S	4
May,	75	85	81	82	93	89	74	88	84	8													$84\frac{2}{3}$		683	15	12	9.6	7	24	13	S	2
June,	77	84	81	80	90	85	78	86	83	4													83		686	25	14	17.4	1	29	5	SE	1
July,	77	84	81	77	90	85	78	85	83	4													83		686	25	20	15.	1	30	5	S&SE	1
August,	77	83	81	80	89	85	80	84	82	4	29.57	29.75	29.67	.18	29.56	29.75	29.66	.19	29.61	29.76	29.70	.15	$82\frac{2}{3}$	29.67	686	25	23	16.9	5	26	15	S&SE	1
September,	76	84	80	77	90	85	78	85	$81\frac{1}{2}$	5	.72	.95	.81	.23	.68	.90	.80	.22	.75	.97	.83	.22	$82\frac{1}{3}$	.81	690	24	12	11.3	10	20	5	S&SE	1
October,	74	83	79	77	90	86	76	85	82	7	.74	30.04	.92	.30	.77	30.00	.91	.23	.76	30.02	.92	.26	$82\frac{2}{3}$	.91	692	2	3	.8	19	12	1	NW	1
November,	66	78	71	76	86	81	71	80	75	10	.60	.12	30.00	.52	.88	.05	.99	.17	.92	.08	30.02	.16	76	30.00	702		1	.9	23	7		NW	1
December,	58	69	63	68	79	74	65	73	68	11	30.02	.17	.09	.15	30.00	.14	30.07	.14	30.02	.17	.09	.15	$68\frac{2}{3}$	.08	718		1	05	26	5		NW	1
January, 1785.	57	70	61	69	78	72	64	74	$66\frac{1}{2}$	11	29.98	.17	.08	.19	29 97	.14	.07	.17	.03	17	.09	.14	$66\frac{2}{3}$	.08	722				29	2		SW	2
Mean	70	$80\frac{5}{12}$	$75\frac{8}{12}$	$76\frac{6}{12}$	88	83	$73\frac{6}{12}$	$82\frac{6}{12}$	$78\frac{4}{12}$	$7\frac{4}{12}$	29.77	30.03	29.93	.26	29.81	30.00	29.92	.19	29.85	30.03	29.94	.18	79	29.92	695		105	81.0	154	212	59		2

ABSTRACT *of a* METEOROLOGICAL REGISTER, *kept at* Calcutta, 1785.

MONTH.	THERMOMETER.									Difference between morn. & mid-day heat.	BAROMETER.												Mean state atmosphere.			Moisture.			Appearance atmosphere.		Thunder No. times.	Winds.	
	Morning.			Noon.			Evening.				Morning.				Noon.				Evening.														
	Lowest.	Highest.	Mean.	Lowest.	Highest.	Mean.	Lowest.	Highest.	Mean.		Lowest.	Highest.	Mean.	Utmost variation.	Lowest.	Highest.	Mean.	Variation.	Lowest.	Highest.	Mean.	Variation	Temperature.	Weight.	Density.	Moisture.	No. rainy days	Quant. rain.	Number clear days.	Cloudy do.		Point.	Force.
January,	57	70	61	69	78	72	64	74	66	11	29.98	30.17	30.08	.19	29.97	30.14	30.07	.17	30 03	30.17	30.09	.14	$66\frac{2}{3}$	30.08	722				29	2		SW	2
February,	68	74	71	75	86	79	69	76	74	$8\frac{1}{2}$	.89	.14	.02	.25	.89	.17	.01	.28	29.96	.15	.04	.19	75	.02	706		4	2.9	17	11	4	SW	1
March,	68	80	75	80	90	85	73	83	78	10	.85	.12	29.95	27	.84	.10	29.92	.26	.86	.13	29.97	.27	79	29.95	698		3	0.5	20	11	5	S	3
April,	69	83	79	75	91	85	74	85	82	8	.70	29.97	.83	.27	.68	29.92	.81	.24	.74	9.97	.86	.23	$82\frac{1}{2}$	.83	690		6	8.0	17	13	6	S	3
May,	79	87	83	87	94	90	80	89	85	7	.60	.96	.77	.36	.53	.92	.74	.39	.63	30.03	.82	.30	86	.77	682		10	6.0	18	13	14	S	2
June,	79	84	81	80	90	84	79	85	82	3	.44	.70	.59	.26	.40	.68	.56	.28	.47	29.72	.61	.26	83	.58	684		24	24.4	4	26	16	SE	1
July,	79	84	81	80	89	84	80	87	82	3	.44	.73	.59	.29	.45	.67	.56	.22	.47	.73	.62	.26	83	.59	684		24	12.8	4	27	11	SE	1
August,	79	84	81	80	89	84	80	86	82	3	.50	.78	.62	.28	.49	.72	.59	.23	.57	.78	.64	.26	83	.62	685		20	9.3	3	28	16	SE	1
September,	80	84	81	81	89	85	80	85	82	4	.62	.83	.71	.21	.59	.82	.68	.23	.66	.87	.75	.21	83	.71	686		16	11.7	8	22	13	S	1
October,	77	84	81	82	88	85	79	85	83	4	.83	.98	.90	.15	.81	.96	.87	.15	.85	.98	.96	.13	83	.91	691		7	1.4	21	10	4	NW	1
November,	67	80	73	74	85	78	71	82	75	5	.90	30.10	.99	.20	.82	30.08	.98	.26	.80	30.12	30.00	.32	75	.98	705		4	0.5	26	4	0		2
December.	63	70	66	71	76	73	66	73	69	7	.97	.09	30.02	.12	.90	.06	.98	.16	.99	.10	.03	.11	69	30.01	716				31				1
Tot. Mean.	$72\frac{1}{12}$	$80\frac{4}{12}$	$76\frac{2}{12}$	$77\frac{10}{12}$	$87\frac{1}{12}$	$82\frac{5}{12}$	$74\frac{7}{12}$	$82\frac{6}{12}$	$78\frac{6}{12}$	6	29.73	29.96	29.84	.24	29.70	29 94	29.81	.24	29.75	29 96	29.87	.22	77	29.84	696		118	77.5	198	167	89		2

CALCUTTA, NOVEMBER 1784.

Days.	Thermometer.			Mean density of each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.			
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	E.	
								d.	m.	d.	m.	d.	m.						
1	74	85	80	MONDAY	30.02	29.99	30.03	20	1	45		35			NW	0	1	0	Clear,
2	77	85	80	L. Q. 705	.05	.96	.00	15		40		30				0	1	0	Cloudy,
3	77	86	80		.00	.98	.02	10		40		30				0	1	0	Clear,
4	76	85	80		.02	30.00	.03	0		35		35				0	2	0	Cloudy,
5	78	85	79		00	29.97	.02	5		40		35				0	1	0	Clear,
6	76	84	80		.00	30.00	.02	0		40		35				1	2	0	ditto,
7	76	86	79		.02	.02	.02	20		45		45				0	2	1	ditto,
8	73	82	78		.02	.02	.00	35		50		50				0	1	0	ditto,
9	72	83	76	New Moon 707	.02	.02	.06	45		55		50				1	1	0	ditto,
10	72	81	78		.10	.08	.08	30		50		45			N	1	1	0	Cloudy,
11	74	76	76		.12	.05	.07	15		0		35		0.9	NE	0	2	0	ditto,
12	75	79	76		.07	.04	.05		40		15		15		N	0	1	0	Clear,
13	71	81	77		.05	29.98	.02		40	30			15			0	1	0	ditto,
14	77	79	75		29.60	.89	29.92		10	25		20			NE	1	1	0	ditto,
15	74	80	75		.94	.95	30.00		20	25		15				0	1	0	ditto,
16	73	81	73		30.01	30.05	.07		20	40		15			N	0	1	0	ditto,
17	66	80	72	F. Q. 718	.07	.03	.06		0	50		35			NE	1	2	1	ditto,
18	67	78	74		.04	.02	.04	15		45		40			NW	0	1	1	ditto,
19	68	78	72		.03	29.99	.04	10		45		40			N	1	1	0	ditto,
20	69	78	75		.03	30.02	.05	15		40		35			NW	0	1	0	ditto;
21	69	79	74		.02	29.97	.02	5		40		35				0	1	0	ditto,
22	68	78	73		29.98	.93	29.97	0		40		30				0	0	0	Hazy,
23	69	78	72		.97	.92	.94	0	5	35		15			N	1	1	0	Clear,
24	70	78	73	Full Moon 717	.90	.88	.95		35	5					NW	1	1	0	Cloudy,
25	68	78	71		.92	.96	30.02		35		5		5			0	2	0	ditto,
26	67	79	73		30.03	30.03	.04		40	20		20				0	1	0	Clear,
27	67	79	73		.00	.00	.03	20		35		30				1	1	0	ditto,
28	69	86	75		.00	.00	.03	10		35		30				0	1	0	ditto,
29	67	80	73		.02	29.99	.04	15		45		20			N	0	1	1	ditto,
30	67	80	73		.05	30.04	.08	20		50		30			NW	1	2	1	ditto,
mean	71½	80	75½		30.00	29.99	30.02	10	8	35	½	28	1	0.9	NW	⅓	1⅕	⅙	

A GENERAL STATE *of the* WEATHER *for* DECEMBER 1784.

		M.	N.	E.	
Thermometer,	Greatest altitude,	69	79	73	$68\frac{2}{3}$ Mean heat.
	Least do. ...	58	68	65	
	Mean do. ...	$63\frac{1}{2}$	74	$86\frac{1}{2}$	
Barometer,	Greatest do. ...	30.17	30.14	30.17	30°.0′8. Mean state of the atmospnere.
	Least do. ...	30.02	30.00	30.02	
	Mean do. ...	30.09	30.07	30.09	
	Greatest variation, ...	00.15	00.14	00.15	.717 Mean density.
	Mean density, ...	.727	.709	.721	
Hygrometer,	Mean moist and drought,	24 d.	48 d.	38 d.	

Clear,	...	26 days.
Cloudy,	...	5 do.
Rain,		1 do.
Quantity of do.	...	0·05 Inches.

The winds were constantly NW, except a few days, when it was inclined a little to the E, which always brings on cloudy thick weather. The whole month remarkably dry, and the atmosphere of such a density as greatly to exceed any of the former. At this season of the year there is generally a thick disagreeable fog in the mornings and evenings : however, this month, on the contrary, has been very clear and serene, and but seldom thick fogs at either of these times.

CALCUTTA, DECEMBER 1784.

Days.	Thermometer.			Mean density of each quarter of the Moon,	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	E.	
								d.	m.	d.	m.	d.	m.						
1	65	79	72	L. Q. 721	30.07	30.10	30.10	20		45		30		0.05	NE	1	1	1	Cloudy,
2	68	76	72		.07	.04	.07	40		50		30				1	1	0	ditto,
3	69	78	72		.03	.01	.06	20		40		20				0	1	0	ditto,
4	67	78	73		.06	.05	.09	15		30		15			NW	1	2	1	ditto,
5	65	79	72		.10	.08	.09	0		45		25				1	2	0	Clear,
6	65	75	70		.08	.05	.10	30		50		45				2	3	0	ditto,
7	63	75	68		.08	.03	.05	45		55		45				1	2	1	ditto,
8	61	74	68		.07	.04	.09	40		55		45				2	1	0	ditto,
9	61	75	69	New Moon 728	.07	.06	.07	30		55		45				2	1	0	ditto,
10	62	75	68		.08	.06	.07	30		55		40				1	1	0	ditto,
11	61	75	68		.07	.04	.08	30		55		45				1	1	0	ditto,
12	62	73	68		.09	.03	.08	20		40		35				1	0	0	ditto,
13	62	74	69		.08	.04	.05	10		40		40				0	1	0	ditto,
14	64	71	69		.05	.01	.04	20		35		25			N	0	0	0	Cloudy,
15	66	73	68		.04	.07	.08	20		40		35			NNE	[illegible]	1	0	ditto,
16	64	75	70	F. Q. 725	.09	.06	.08	30		45		40			NW	0	1	0	Clear,
17	67	75	70		.07	.01	.02	30		40		30				0	1	0	ditto,
18	66	76	72		.02	.00	.07	10		40		25			NE	0	2	0	ditto,
19	67	75	71		.06	.06	.07	0		50		25			W	0	1	0	ditto,
20	66	75	66		.06	.05	.08	25		55		40			NW	0	1	0	ditto,
21	65	74	67		.11	.10	.13	35		60		50				0	1	0	ditto,
22	61	71	65		.17	.13	.17	45		50		50				0	2	0	ditto,
23	58	71	65	Full Moon 732	.17	.12	.14	35		45		40				1	1	0	ditto,
24	60	72	66		.14	.13	.14	10		50		40				1	1	0	ditto,
25	60	72	68		.15	.14	.16	15		45		45				0	1	0	ditto,
26	61	73	68		.17	.14	.14	5		45		35				1	2	0	ditto,
27	61	73	68		.15	.13	.14	15		50		40				1	2	0	ditto,
28	60	72	67		.14	.10	.13	20		55		40				1	1	0	ditto,
29	60	70	65		.10	.10	.10	30		55		45			W	0	1	0	ditto,
30	60	69	65		.10	.06	.07	40		55		45			NW	0	1	0	ditto,
31	60	68	65		.08	.05	.06	40		55		45				0	1	0	ditto,
mean	63½	74	68½		30.09	30.07	30.09	24		48		38		0.05		⅔	1⅓	1/10	

A GENERAL STATE *of the* WEATHER *for* JANUARY 1785.

		M.	N.	E.	
Thermometer,	Greatest altitude, ...	70	78	74	66 Mean heat.
	Least do. ...	57	69	64	
	Mean do. ...	61	72	$66\frac{2}{3}$	
Barometer,	Greatest do. ...	30.17	30.14	30.17	Mean state of the atmosphere.—30.08.
	Least do. ...	29.98	29.97	30.03	
	Mean do. ...	30.08	30.07	30.09	
	Greatest variation, ...	00.19	00.17	00.14	
	Mean density, ...	·732	·712	·723	722 Mean density.
Hygrometer,	Moisture and drought,	30 d.	50 d.	40 d.	

Clear,	...	29	days.
Cloudy,	...	2	do.

The atmosphere very dry and elastic.

The winds variable ; but from the middle of the month were almost constantly from the SW and S, and often pretty strong.

The mercury in the Barometer stood very high till about the end of the month, when a very sensible change took place, both with regard to the warmth and serenity of the weather. Frequent heavy dews about the same time.

The mornings always very foggy.

The medium heat of the sun at mid-day (the instrument being exposed five minutes) was 90°.

CALCUTTA, JANUARY 1785.

Days.	Thermometer.			Mean density of each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	E.	
								d.	m.	d.	m.	d.	m.						
1	60	69	64		30.09	30.09	30.09	30		50		45			WN	0	1	0	Clear,
2	57	69	64		.09	.09	.11	40		50		45			NW	0	1	0	ditto,
3	60	71	65		.11	.06	.07	25		45		40				0	1	0	ditto,
4	59	69	65	L. Q. 732	.04	.04	.09	30		50		40			WNW	0	1	0	ditto,
5	63	70	66		.10	.08	.08	35		50		40				0	2	0	ditto,
6	64	70	66		.07	.08	.12	30		50		40			W	0	2	0	ditto,
7	63	72	67		.13	.13	.17	35		55		50			NW	0	2	0	ditto,
8	59	72	67		.14	.13	.10	35		60		50			N	1	2	0	ditto,
9	58	73	65		.10	.09	.09	35		60		45			NW	1	2	0	ditto,
10	60	70	65		.10	.10	.14	40		60		50				0	1	0	ditto,
11	58	72	65	New Moon 736	.13	.10	.12	35		60		50				1	2	1	ditto,
12	59	72	65		.11	.11	.11	25		50		45			N	1	2	0	ditto,
13	60	72	66		.11	.11	.12	30		50		45			NW	2	1	0	ditto,
14	60	73	67		.12	.11	.13	40		45		45				0	1	0	ditto,
15	58	71	65		.14	.14	.14	35		50		50				1	2	0	ditto,
16	60	70	65		.15	.15	.17	40		55		50				0	2	0	ditto,
17	60	69	65	F. Q. 736	.17	.13	.10	45		55		50			N	1	1	0	ditto,
18	59	70	65		.10	.10	.06	40		55		50			NW	1	2	0	ditto,
19	60	70	65		.08	.05	.05	40		60		50				0	2	0	ditto,
20	58	71	65		.05	.05	.05	30		55		50				0	1	0	ditto,
21	64	74	67		.02	.00	.07	0		40		30			SW	0	1	0	ditto,
22	60	71	65		.08	.05	.08	40		55		50			W	1	2	0	ditto,
23	59	70	65		.04	.04	.05	40		60		55			SW	1	2	0	ditto,
24	62	70	66		.06	.04	.05	40		55		50			W	0	2	0	ditto,
25	62	75	68	Full Moon 728	.08	.06	.07	40		55		45				0	1	0	ditto,
26	63	74	69		.07	.01	.03	30		45		30			SW	0	2	0	ditto,
27	68	74	70		29.98	29.97	.03		15	40		30			S	0	2	0	ditto,
28	67	76	69		30.01	.98	.04	10		55			10		SW	1	2	0	ditto,
29	65	77	74		.02	30.01	.05	40		60		50			S	0	3	0	ditto,
30	66	76	71		.00	.01	.03	10		40			10			0	3	1	Cloudy,
31	70	78	74		.02	.03	.05		40	0			10			0	3	2	ditto,
mean	61⅓	72	66¾		30.08	30.07	30.09	30	1¾	50		40	1		var.	⅓	2	⅛	Clear.

A GENERAL STATE *of the* WEATHER *for* FEBRUARY 1785.

		M.	N.	E.	
Thermometer,	Greatest altitude,	74	86	76	75. Mean temperature.
	Least do. ...	68	75	69	
	Mean do. ...	71	79½	74	
Barometer,	Greatest do. ...	30.14	30.17	30.15	30.02 Mean state of the atmosphere.
	Least do. ...	29.89	29.89	29.96	
	Mean do. ...	30.02	30.01	30.04	
	Greatest variation, ...	0.25	0.28	0.19	
	Mean density ...	.713	.698	.708	.706
Hygrometer,	Moisture and drought,	0	28 d.	22 d.	

Clear, ...	17	days.
Cloudy, ...	11	do.
Rain, ...	4	do.
Quantity of do.	2-9	inches.

Thunder five times. Mean heat of the sun at mid-day, the Thermometer being exposed five minutes 96°.

The beginning of this month the air was very moist, which is generally the case when the wind comes from the S and SE.

On the contrary, the NW winds which prevailed, renders it very dry and elastic, and has always a very great effect in raising the mercury in the Barometer. During the whole of this month the mornings were extremely thick and foggy: on the 1st, 8th, and 12th, moderate storms from the NW.

CALCUTTA, FEBRUARY 1785.

Days.	Thermometer.			Mean density of each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	E.	
								d.	m.	d.	m.	d.	m.						
1	71	77	74		30.00	29.90	29.95		50	0	0		40	0.5	S	1	4	1	Cloudy,
2	73	76	71		29.89	.89	.96		40		15		20		SE	1	2	1	ditto,
3	69	77	73	L. Q. 714	.96	.96	30.03		-30	25		20				0	1	0	Clear,
4	72	78	74		30.08	30.07	.12		3		5		30		S	0	1	0	Cloudy,
5	72	79	75		.08	.04	.04		4	15			25			0	1	1	Clear,
6	74	80	76		29 98	.03	.05		50	30			20			3	2	1	Cloudy,
7	72	80	72		.98	29.99	.04		45	35		0	9		SE	1	1	1	Clear,
8	75	80	73		30.05	30.04	.11		30		15		5	0.8	E	0	1	0	ditto,
9	68	78	74	New Moon 711	.07	.03	.03		35		15		5		W	1	1	0	Cloudy,
10	72	80	75		29.97	29.95	29.98		15	40		30			N	2	1	0	Clear,
11	70	80	74		.98	.99	30.03	10		60		55				1	1	0	ditto.
12	73	82	69		30.03	30.03	.12	30		50		40		1.1	NW	0	0	3	Cloudy,
13	69	79	72		.05	.00	.06	25		45		40				1	0	2	ditto,
14	69	81	74		.01	.00	.04	35		55		50			SW	1	1	0	Clear,
15	70	81	75		.04	.01	.04	30		45		45				0	1	0	ditto,
16	70	75	73	F. Q. 717	.07	.06	.08	35		55		50			NW	3	3	0	Cloudy,
17	69	80	73		.06	.02	.05	40		60		55			SW	0	1	1	Clear,
18	70	73	69		.02	.02	.04	35		30			5	0.7		0	2	1	Cloudy,
19	67	75	71		.03	.04	.03		15			15				0	2	1	ditto,
20	69	79	72		.03	.03	.03		10	25		20			NW	0	2	0	Clear,
21	69	77	73		.04	.04	.04	0		20		25			W	0	2	1	ditto,
22	70	82	75		29.98	29.97	29.97		10			15				0	1	1	ditto,
23	74	84	76		.99	.96	30.00		20	35		45				1	2	1	ditto,
24	72	82	75	Full Moon 710	30.00	.98	29.98	35		55		45				0	1	0	ditto,
25	72	86	76		29.96	.96	.97	30		60		55			NW	0	1	0	Cloudy,
26	73	81	76		.96	.96	30.00	50		60		55			NW	1	1	0	Clear,
27	73	83	74		30.03	30.03	.10	50		60		55				0	1	0	ditto,
28	70	81	73		.14	.17	.15	50		60		55				0	1	0	ditto,
mean	71	19½	74		30.02	30.01	30.04	15	15	30	2	28	6	2.9		½c	1⅓	½	

A GENERAL STATE *of the* WEATHER *for* MARCH 1785.

		M.	N.	E.	
Thermometer,	Greatest altitude,	80°	90°	83°	79°
	Least do. ...	68	80	73	
	Mean do. ...	75	85	78	
Barometer,	Greatest do. ...	30.12	30.10	30.13	29.95.
	Least do. ..	29.85	29.84	29.86	
	Mean do. ...	29.95	29.92	29.97	
	Greatest variation, ...	.27	.26	.27	
	Mean density ...	.075	.688	.700	.698.
Hygrometer,	Moisture and drought,	0.0	36 d.	18 d.	

Clear,	20	days,
Cloudy,	11	do,
Rain,	3	do.
Quantity of do.	0-5	inches.

Thunder five times. Mean heat of the sun 100°.

There were two or three thunder-storms this month; but gentle, and attended with little rain. Several mornings about the beginning were very foggy and damp, and continued so; but in a lesser degree nearly throughout the month. Heavy dews from the 15th.

The Barometer continued low, which may proceed from the high winds that prevailed, as well as from the extreme rarefaction of the atmosphere at this season of the year. We had often the appearance of rain (as must always be the case) while the wind comes from the south quarter and bringing with it so much vapour.

CALCUTTA, MARCH 1785.

Days.	Thermometer.			Mean density at each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	E.	
								d.	m.	d.	m.	d.	m.						
1	68	84	73	L. Q. 713	30.12	30.10	30.13	55		60		60			NW	1	2	0	Clear,
2	68	84	73		.10	.07	.08	50		60		55				0	1	0	ditto,
3	69	83	74		.05	.04	.07	50		55		50			SW	0	2	1	ditto,
4	72	82	75		.04	.03	.06	25		50		50				1	2	2	ditto,
5	73	83	75		.05	.04	.04		5	35		25			SE	0	3	1	ditto,
6	73	81	76		.03	29.98	.00		5	50		35				0	4	1	ditto,
7	78	82	77		29.97	.99	.04		0	55		40			S	0	4	1	ditto,
8	73	82	77	New Moon 709	30.02	30.03	.07	20		45		40			SE	0	3	2	Cloudy,
9	73	87	77		.06	.04	.07	40		55		40			SW	1	2	0	Clear,
10	74	84	74		.05	.02	.05	25		50		45		0.1	SW	0	3	1	Cloudy,
11	71	83	76		.02	29.98	.02	45		50		40			SE	0	2	1	Clear,
12	74	85	77		29.98	.90	29.93	10		40		15				0	2	1	Cloudy,
13	75	84	75		.90	.84	.89			20		40		0.3		1	3	2	Clear,
14	71	84	74		.90	.88	.93	35		30		15	some hail			0	3	1	Cloudy,
15	75	84	74	F. Q. 702	.90	.85	.93			40		20				1	4	3	ditto,
16	73	83	77		.87	.87	.97	10	20	20		0				3	4	4	ditto,
17	77	85	80		.90	.89	.97		10	25		0			S	1	1	1	ditto,
18	77	86	80		.96	.88	.93		20	21			10		SW	0	2	1	Clear,
19	77	89	82		.92	.87	.92		25	50		10			SE	1	2	1	ditto,
20	78	90	83		.89	.85	.88		35	40		10			SW	0	2	2	ditto,
21	78	87	81		.86	.84	.87		20	20			10		SE	1	3	1	Cloudy,
22	79	86	81		.87	.87	.89		30	10			10		S	1	4	2	ditto,
23	79	85	81	Full Moon 696	.85	.84	.89		30	10				0.1		1	3	4	Clear,
24	77	85	80		.87	.85	.89		10	20						1	2	3	ditto,
25	78	87	81		.89	.92	.98		30	35						0	3	2	ditto,
26	79	86	81		.96	.91	.91		30	20			10			0	3	3	Cloudy,
27	79	88	82		.89	.93	.86		20	20						2	3	1	Clear,
28	79	88	82		.85	.87	.92		35	15			5			1	2	3	ditto,
29	79	88	83		.90	.87	.92		25	20			5			1	2	2	ditto,
30	80	84	82		.95	.87	.90		30	20			20			0	0	0	Cloudy,
31	79	88	82		.90	.85	.90	25		60		40				0	1	0	Clear,
mean	75	85	78		29.95	29.92	29.97	13	13	36		20	2	0.5	S	½	3	2	Clear.

A GENERAL STATE *of the* WEATHER *for* APRIL 1785.

		M.	N.	E.	
Thermometer,	Greatest altitude,	83	91	85	82½
	Least do. ...	69	75	74	
	Mean do. ...	79	86½	82	
Barometer,	Greatest do. ...	29.97	29,92	29.97	69.83
	Least do. ...	29.70	29.68	29.74	
	Mean do. ...	29.83	29.81	29.86	
	Greatest variation, ...	.27	.24	.23	
	Mean density, ...	.695	.684	.691	.690
Hygrometer,	Moisture and drought,	20 m	20 d	4 d	

Clear,	...	17	days.
Cloudy,	...	13	do.
Rain,		6	do.
Quantity of do.	...	8	Inches.

The quantity of rain that fell on the sixteenth and seventeenth was very considerable; and the variation that appeared on the mercury before and after the thunder-storms was very great, sometimes 00′.30 in the space of a few minutes.

Thunder six times. Mean heat of the sun 108° to 110°.

The temperature of the air throughout this month was less warm and sultry than it is generally found at this time of the year; as also, the storms that came from the NW were fewer in number. The air rather moist, and little or no variation in the winds, they being always directly S and SE.

CALCUTTA, APRIE 1785.

Days.	Thermometer.			Mean density of each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	E.	
								d.	m.	d.	m.	d.	m						
1	79	84	80		29.90	29.86	29.90	30		55		50			S	0	2	2	Clear,
2	75	90	80		.89	.82	.85	25		60		30				0	1	2	ditto,
3	77	90	83	L. Q. 697	.82	.77	.81		20	60		30				1	3	2	ditto,
4	77	90	82		.82	.80	.84		10	45		20				0	1	3	ditto,
5	79	88	83		.83	.80	.83			45		30				0	3	1	ditto,
6	79	90	83		.81	.82	.83			35		25				0	3	3	ditto,
7	78	88	82		.86	.85	.88			20		20				1	4	3	ditto,
8	80	88	81		.88	.83	.84		15	30						0	4	4	Cloudy,
9	80	87	84	New Moon 694	.82	.81	.84		30	20		10				2	2	2	Clear,
10	80	87	84		.78	.77	.85		30	40			10			1	4	1	Cloudy,
11	81	88	85		.83	.82	.86		25	50		15				1	2	3	ditto,
12	81	88	85		.82	.80	.87		30		10	35				1	0	1	ditto,
13	81	85	84		.82	.86	.89		25	30		35				1	0	0	ditto,
14	83	84	82		.87	.87	.89		10	40		40				1	4	0	ditto,
15	81	84	83		.90	.92	.97	20		30					NW	1	0	1	ditto,
16	78	81	74	F. Q. 698	.97	.92	.96	45			40		0	2.4		3	2	4	ditto,
17	69	75	75		.86	.79	.83		30		20		50	3.6	NE	3	3	2	ditto,
18	77	82	80		.82	.88	.94		60	15			20	0.5	S	0	0	0	Clear,
19	79	84	82		.92	.84	.90		40							0	4	0	Cloudy,
20	78	85	81		.85	.79	.93		20							1	2	2	Clear,
21	75	84	80		.85	.83	.90		10							1	3	2	Cloudy,
22	74	82	80		.85	.84	.87		20		10		10	0.9		1	2	0	Clear
23	79	85	83		.83	.80	.83		40		10		20		SE	1	2	1	Cloudy,
24	81	88	85	Full Moon 694	.80	.75	.78		40	10			20			1	3	1	Clear,
25	82	89	85		.77	.76	.84		40	20			10			1	2	1	ditto,
26	83	89	81		.76	.77	.87		30		10		10	0 3	S	1	4	4	Cloudy,
27	82	89	82		.72	.68	.83		40		20		20	0.3		3	4	4	ditto,
28	79	87	83		.70	.75	.74		40	20			30			1	3	3	ditto,
29	82	90	85		.76	.79	.84		50	10			15			0	3	1	ditto,
30	82	91	85		.82	.83	.84		40	10			15			1	3	1	ditto,
mean	79	86½	82		29.83	19.81	29.86	4	24	24	4	12	8	8.0	S	1	3	2	Cloudy.

A GENERAL STATE *of the* WEATHER *for* MAY 1785.

		M.	N.	E.	
Thermometer,	Greatest altitude, ...	87	94	89	86
	Least do. ...	79	87	80	
	Mean do. ...	83	$89\frac{2}{3}$	85	
Barometer,	Greatest do. ...	29.96	89.92	30.03	29.77
	Least do. ...	29.60	29.53	29.63	
	Mean do. ...	29.77	29.74	29.82	
	Greatest variation, ...	.36	.39	.30	
Hygrometer,	Mean Moisture, ...	1 m	30 d	20 d	.682
	Mean density,	.685	.676	.685	

Clear,	...	16	days.
Cloudy,	...	13	do.
Rain,	...	10	times.
Quantity,	...	6	inches.

Thunder fourteen times. Mean heat of the sun 110° to 111°.

The air this month has been drier than that of the preceding; but the winds being more from the SE quarter, is the reason of the mercury being so low: much close and sultry weather about the middle. The variation on the Barometer much greater than usual.

CALCUTTA. MAY 1785.

Days.	Thermometer.			Mean density at each quarter of the Moon.	Barometer.			Hygrometer.						Rain	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	E.	
								d.	m.	d	m	d.	m.						
1	82	92	86	L. Q. 688	29.82	29.80	29.81		40	10			10		S	1	2	1	Clear,
2	83	91	85		77	.74	.75		30	10			10			2	2	2	ditto,
3	83	91	87		.75	.68	.75		30	20		20				1	1	2	ditto,
4	87	91	86		.76	.78	.83	15		40		30				6	3	1	ditto,
5	85	89	86		.78	.83	.87	0		30		20				1	4	4	Cloudy,
6	83	90	83	New Moon 690	.96	.86	30.03	15		30		20		0.5		2	3	2	Clear,
7	81	87	84		.78	.78	29.94	10		35		30			E	1	2	1	Cloudy,
8	82	90	87		.95	.92	.97		10	50		30			S	0	2	0	Clear,
9	83	90	85		.94	.89	.95		10	50		25				0	2	1	ditto,
10	83	89	85		.92	.85	.89	10		45		20		0.3	SE	0	2	0	ditto,
11	84	90	83		.86	.79	.83	10		50		30				0	2	2	ditto,
12	83	90	83		.80	.77	.85			50		15		0.1		1	2	2	ditto,
13	84	89	85		.80	.78	.83		10	45		35				3	3	0	ditto,
14	84	91	85	F. Q. 688	.83	.77	.82	25		50		30				0	1	0	Cloudy,
15	84	92	86		.84	.77	.80		10	60		55				0	1	0	Clear,
16	86	93	84		.81	.76	.86	40		60		55			SW	0	0	0	ditto,
17	82	92	85		.83	.81	.90	20		56		30				0	1	0	Cloudy,
18	80	88	84		.77	.86	.93		10	40		20		1.4	S	0	1	0	ditto,
19	81	88	86		.89	.81	.83	10		50		40			SW	1	0	0	Clear,
20	83	89	86		.80	.72	.79	10		50		40			S	0	0	0	Cloudy,
21	84	91	83	Full Moon 685	.75	.67	.79	10		55		40				0	1	1	Clear,
22	82	90	87		.74	.65	.75	30		40		40				0	1	0	Cloudy,
23	83	91	89		.69	.58	.66	10		40		35			SE	0	1	0	Clear,
24	87	94	89		.63	.53	.66	20		20		20		0.2	S	0	0	4	Cloudy,
25	84	92	82		.60	.59	.63		10	60		10		1.3		1	0	0	ditto.
26	79	88	85		.65	.64	.70		10	50		20			SE	1	0	0	ditto,
27	84	90	80		.65	.64	.76		20	40			10	0.5		0	3	1	ditto,
28	82	88	85		.70	.70	.78		20	40			10			0	1	3	Clear,
29	81	88	82		.73	.70	.75	10		40		10		0.4	S	3	3	1	Cloudy,
30	84	90	85		.74	.66	.72		20	0				0.1 -		3	3	2	Clear,
31	83	87	85		.61	.68	.72		40		20		40	1.2	SW	2	1	1	Cloudy,
mean	83	89⅗	85		29.77	29.74	29.82	8	9	40	1	23	3	6.0		4	2	1	Clear.

A GENERAL STATE *of the* WEATHER *for* JUNE 1785.

		M.	N.	E.	
Thermometer,	Greatest altitude,	84	90	85	82⅔
	Least do. ...	79	80	79	
	Mean do. ...	81½	84½	82	
Barometer,	Greatest do. ...	29.70	29.68	29.72	29.58
	Least do. ...	29.44	29.40	29.47	
	Mean do. ...	29.59	29.56	29.61	
	Greatest variation, ...	.26	.28	.25	
	Mean density ...	.687	.681	.685	.684
Hygrometer,	Mean moisture;	50 m	30 m	40 m	

Clear, ...	4	days.
Cloudy, ...	26	do,
Rain, ...	24	times.
Thunder, ...	16	do.
Quantity of do.	24-4	inches.

Mean heat of the Sun 106°.

The quantity of rain this month has been uncommonly great: and scarce a day has passed without some falling; the weather of course disagreeable and unhealthy.

The mercury in the Barometer very low, which seldom fails to be the case while the winds come from the SE and E quarters.

CALCUTTA, JUNE 1785.

Days.	Thermometer			Mean density at each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	E.	
								d.	m.	d.	m.	d.	m.						
1	84	90	83		29.61	29.54	29.65		40		10		20	.02	S			1	Cloudy,
2	83	85	82		.63	.61	.68		40		20		40		SE	1	1		ditto,
3	81	90	83		.68	.67	.70		45		0		20				1	1	Clear,
4	81	85	82	New Moon 687	.70	.66	.72		40		40		50	0.7		1			Cloudy,
5	81	86	83		.70	.62	.64		40		30		40		NE	1		1	ditto,
6	81	85	83		.62	.55	.61		60		30		40	0.1	E	1	1	1	ditto,
7	82	85	82		.59	.61	.69		50		50		50	0.1		1	1		ditto,
8	82	84	80		.64	.60	.68		60		60		60	0.5	SE	1			ditto,
9	80	80	82		.68	.65	.70		60		60		60	2.7			1	1	ditto,
10	80	84	84		.57	.64	.68		60		40		60	1.5	S		1		Clear,
11	82	84	84		.67	.64	.70		60		20		50	0.1				1	Cloudy,
12	82	87	84	F. Q. 681	.70	.68	.70		50		10		30				1		Clear,
13	84	87	85		.62	.68	58		30		30		30				1		ditto,
14	83	87	81		.56	.46	.50		50		30		30	0.2			1		Cloudy,
15	84	84	82		.44	.40	.47		50		50		40	2.9	SE			2	ditto,
16	81	84	80		.48	.49	.57		60		50		50	1.7			1		ditto,
17	82	83	80		.54	.58	.65		60		60		50	1.4	E		1		ditto,
18	79	82	79		.63	.62	.66		60		60		60	2.9	SE		1		ditto,
19	80	82	80	Full Moon 687	.58	.56	.60		60		40		60	1 3		1	2	1	ditto,
20	80	82	81		.57	.54	.62		60		40		50	0.2		2	1	1	ditto,
21	79	83	82		.57	.54	.60		50		40		40	0.3			1		ditto,
22	81	84	82		.57	.55	.57		40		40		50	N			1	1	ditto,
23	81	82	89		.55	.55	.59		50		30		60	5.9					ditto,
24	80	84	82		.56	.52	.58		50		30		40	0.1		1	1		ditto,
25	82	85	83		.53	.52	.57		50		30		40	N		1	1	2	ditto.
26	82	85	83	L. Q. 681	.52	.52	.55		50		30		40	0.1		1			ditto,
27	83	85	84		.47	.48	.54		50		30		40	0.1				1	ditto,
28	82	84	83		.35	.45	.50		50		30		40	0.6		1			ditto,
29	82	85	84		.48	.44	.48		50		30		40				2		ditto,
30	82	85	84		.46	.45	.49		50		30		40	0.8	NE		1		ditto.
mean	81½	84½	82		29.59	29.56	29.61		50		30		40	24.4		½	¾	½	Cloudy

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A GENERAL STATE *of the* WEATHER *for* JULY 1785.

			M.	N.	E.	
Thermometer,	Greatest altitude,		84°	89	87	$82\frac{2}{3}$
	Least do.	...	79	80	80	
	Mean do.	...	$81\frac{1}{3}$	$84\frac{1}{3}$	$82\frac{1}{3}$	
Barometer,	Greatest do.	...	29.73	29.67	29.73	29.59
	Least do.	..	29.44	29.45	29.47	
	Mean do.	...	29.59	29.56	29.62	
	Greatest variation,	...	.29	.22	.26	
	Mean density,	...	.686	.681	.686	.684
Hygrometer,	Mean moisture,	...	50 m	35 m	45 m	

Clear,	4	days.
Cloudy,	27	do.
Rain,	24	times.
Quantity of do.	12-8	inches.
Thunder,	11	times.

Mean heat of exposed air 100°.

The weather this, as the preceding month, very relaxing and disagreeable, although the quantity of rain only about one half. The low state of the mercury is undoubtedly affected by the easterly winds, as is no less the animal spirits.

CALCUTTA, JUEY 1785.

Days.	Thermometer.			Mean density of each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M		N.		F.			Point.	M.	N.	E.	
								d.	m.	d.	m.	d.	m.						
1	82	86	85		29.47	29.46	29.52		40		20		40	0.1	SE	0	0	0	Cloudy,
2	80	80	83		.51	.50	.58		40		30		40	0.3	NE	1	1	2	ditto,
3	79	83	81		.52	.53	.57		50		30		50	0.2		1		3	ditto,
4	80	84	81		.56	.54	.60		60		40		0	2.6	S	0	1	0	ditto,
5	82	82	81		.58	.54	.59		60		50		60	0.3	S	0	0	0	ditto
6	81	80	80	New Moon 684	.54	.45	.47		60		60		60	2.6	SE	0	0	3	ditto,
7	79	83	81		.44	.47	.57		60		60		60	0.1	SW	0	2	2	ditto,
8	80	82	80		.54	.57	.63		60		60		60	0.4	SE	0	1	1	ditto,
9	80	84	81		.60	.59	.66		60		60		60		S	1	1	1	ditto,
10	80	85	83		.66	.63	.70		60		20		40			0	1	1	ditto,
11	82	84	82		.68	.66	.70		60		30		40	R		0	0	1	ditto,
12	81	85	83		.66	.57	.58		50		30		40	1.3	SE	0	1	2	ditto,
13	83	83	82		.55	.48	.54		50		40		50	1.7		0	1	0	ditto,
14	81	83	81	F. Q. 686	.52	.51	.62		50		40		50	0.1	SE	1	1	3	ditto,
15	80	84	83		.63	.63	.68		50		20		30		SW	2	2	2	ditto,
16	82	85	83		.67	.60	.64		50		30		40	0.3	S	2	1	2	ditto,
17	82	86	84		.62	.57	.57		50		20		30	0.2	S	1	1	4	Clear,
18	82	83	81		.52	.49	.50		50		30		40	0.5	SW	1	2	3	Cloudy,
19	80	84	80		.47	.50	.57		50		20		40	0.6	SE	1	1	0	ditto,
20	80	83	82		.55	.54	.60		50		30		40	0.6	SW	0	0	1	ditto,
21	81	84	82		.57	.55	.63		50		30		40		S	0	1	1	ditto,
22	81	83	81	Full Moon 687	.60	.62	.66		50		40		40	0.1	SE	0	0	0	ditto,
23	80	84	81		.66	.64	.72		50		40		30	0.1		1	1	0	ditto,
24	80	85	83		.72	.67	.73		50		40		20	R		1	2	0	ditto,
25	83	87	85		.73	.67	.69		25		30		10		S	1	1	0	Clear,
26	84	87	84		.72	.67	.72		30		30		10	0.1,	SE	0	0	1	ditto,
27	84	86	84		.70	.63	.67		10		10		20		S	0	0	0	Cloudy,
28	84	85	84	L. Q. 688	.67	.60	.64		30		d		0	0.3	SE	0	2	1	ditto,
29	84	89	87		.64	.58	.66		40		0		20			0	1	0	Clear,
30	84	87	85		.60	.56	.60		40		20		20	0.1		0	1	0	Cloudy,
31	82	86	84		.57	.46	.65		40		10		20	0.1		1	0	1	ditto.
m can	81⅓	84⅓	82⅓		29 59	29.56	29.62		50		36		45	12.8		½	1	1	Cloudy,

A GENERAL STATE *of the* WEATHER *for* AUGUST 1785.

			M.	N.	E.	
Thermometer,	Greatest altitude,		84	89	86	82⅔
	Least do.	...	79	80	80	
	Mean do.	...	81½	84½	82½	
Barometer,	Greatest do.	...	29.78	29.72	29.78	29.62
	Least do.	..	29.50	29.49	29.57	
	Mean do.	...	29.62	29.59	29.64	
	Greatest variation,	...	.28	.23	.21	
	Mean density,	...	.687	.682	.686	.685
Hygrometer,	Moisture,	...	50 m	30 m	40 m	

Clear,	3	days.
Cloudy,	28	do.
Thunder,	16	times.
Rain,	20	do.
Quantity of do.	9-3	inches.

The heat of the sun at mid-day 100°,

Much cloudy weather, but seldom any very heavy falls of rain, and the quantity altogether but moderate. The river very full; and accounts of heavy rains up the conntry.

The Barometer remarkably low the whole month; a proof of there being still much water in the clouds.

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CALCUTTA, AUGUST 1785.

Days.	Thermometer.			Mean density at each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	E.	
								d.	m.	d.	m.	d.	m.						
1	80	84	82		22.53	29.50	29.58		50		40		40	0.3	SE	0	1	1	Cloudy,
2	81	86	83		.56	.53	.60		50		30		20			0	1	0	Clear,
3	83	84	83	New Moon 685	.59	.56	.63		50		20		30			0	1	0	Cloudy,
4	83	87	85		.60	.55	.60		40		20		20	0.1		1	1	0	ditto,
5	81	83	81		.59	.58	.61		40		40		40	1.3		1	1	0	ditto,
6	80	83	81		.56	.54	.60		50		40		50	0.9		1	1	1	ditto,
7	81	84	81		.58	.56	.65		60		40		50	0.2		0	1	0	ditto,
8	80	82	81		.63	.62	.74		60		50		50	1.2		0	1	1	ditto,
9	80	80	80		.74	.74	.76		60		60		50	0.1		0	0	1	ditto,
10	79	84	82		.74	.68	.70		60		50		50			0	1	1	ditto,
11	82	87	85	F. Q. 686	.65	.59	.62		60		30		50			0	0	1	Clear,
12	82	85	83		.60	.61	.64		50		30		40			0	1	1	Cloudy,
13	81	83	82		.63	.60	.64		50		40		30			0	0	0	ditto,
14	81	85	84		.58	.50	.57		50		30		40	0.3		0	1	1	ditto,
15	83	86	84		.53	.49	.57		50		40		30	0.4		0	1	0	ditto,
16	82	83	82		.54	.53	.57		50		30		20	0.5	NE	1	1	2	ditto,
17	82	84	82		.50	.54	.62		50		20		30	0.2	SE	1	1	1	ditto,
18	83	84	83		.62	.58	.64		50		30		40	1.3		1	1	1	ditto,
19	84	87	85	Full Moon 687	.60	.58	.63		50		20		30			0	1	2	ditto,
20	80	89	86		.58	.60	.66		40		0		0		NE	0	1	1	Clear,
21	84	85	85		.62	.60	.67		20		20		20		SE	0	1	0	Cloudy,
22	83	87	84		.62	.57	.64		30		10		20	0.2		4	1	1	ditto,
23	83	85	83		.61	.60	.66		40		30		30	0.1		1	1	1	ditto,
24	81	85	82		.63	.63	.70		40		30		30	0.3	NE	1	1	1	ditto,
25	82	85	84		.68	.67	.72		40		30		40			1	1	0	ditto,
26	81	84	81	L. Q. 690	.70	.66	.71		40		30		40	0.3		0	0	2	ditto,
27	80	84	81		.73	.70	.78		40		30		30	0.1		0	0	1	ditto,
23	81	85	83		.78	.72	.78		40		20		30	0.1		0	0	1	ditto,
29	81	85	83		.74	.67	.76		50		20		30		SE	0	0	1	ditto,
30	82	84	83		.70	.67	.73		40		20		30	0.1		0	0	0	ditto,
31	82	83	82		.67	.62	.69		30		30		30	1.4		1	1	1	ditto,
mean	81½	84½	82½		29.02	29.59	29.64		50		30		40	9.3	SE	½	1	1	Cloudy.

A GENERAL STATE *of the* WEATHER *for* SEPTEMBER 1785.

		M.	N.	E.	
Thermometer,	Greatest altitude, ...	84°	89°	85	$82\frac{2}{9}$
	Least do. ...	80	81	80	
	Mean do. ...	81	85	$82\frac{1}{3}$	
Barometer,	Greatest do. ...	29.83	29.82	29.87	29.71
	Least do. ...	29.62	29.59	29.66	
	Mean do. ...	29.71	29.68	29.75	
	Greatest variation, ...	.21	.23	.21	
Hygrometer,	Moisture, ...	45 m	20 m	25 m	.686
	Density,	.687	.682	.688	

Clear,	...	8	days.
Cloudy,	...	22	do.
Thunder,	...	13	times.
Rain,	...	16	do.
Quantity,	...	11-7	inches.

Mean heat of the sun at mid-day 110°.

The Barometer higher than the former month : about the middle and end, great quantities of rain. By account from Berhampore, the quantity of rain there must have been very considerable, and many parts above, the whole country being under water, and the river swelling prodigiously. This month very unhealthy and many people dying.

CALCUTTA, SEPTEMBER 1785.

Days,	Thermometer.			Mean density at each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	E.	
								d.	m.	d.	m.	d.	m.						
1	80	84	82		29.65	29.64	29.74		40		20		20		NE	2	2	2	Cloudy,
2	80	83	81	New Moon 692	.70	.69	.77		30		20		30	0.2		1	1	1	ditto,
3	80	85	83		.75	.74	.82		50		20		20			1	1	1	Clear,
4	81	87	85		.77	.73	.80		40		10		20		SE	0	1	0	ditto,
5	82	88	85		78	.76	.84		30	10		10				0	1	0	ditto,
6	83	89	85		.80	.74	.80		30	20		0	0			0	1	0	ditto,
7	84	88	85		.76	.73	.77		20	20		10				1	0	0	ditto,
8	82	89	85		.77	.73	.80		30	10		10				1	1		ditto,
9	84	87	85		.80	.76	.85		20	10		0	0			0	1	0	Cloudy,
10	83	85	83	F. Q. 688	.83	.82	.87		20		10	0	0			0	1	0	ditto,
11	83	84	82		.82	.77	.80		40		20		30	0.5	E	0	1	0	ditto,
12	82	86	83		.97	.68	.73		40		20		20	0.3		1	0	1	ditto,
13	82	83	83		.68	.63	.70		40		20		20	0.6		0	0	1	ditto,
14	82	84	82		.66	.62	.69		40		20		20		NE	0	1	0	Clear,
15	81	87	83		.64	.60	.68		40		30		20			0	1	0	Cloudy,
16	81	85	83		.66	.64	.72		40		30		20	0.4	E	2	1	0	Clear,
17	81	84	81	Full Moon 688	.67	.66	.73		50		40		20	0.8	NE	2	1	1	Cloudy,
18	80	83	82		.68	.64	.70		50		40		40	0.3		2	1	2	ditto,
19	81	84	81		.62	.59	.66		50		40		50	0.3	SE	2	1	1	ditto,
20	80	84	80		.62	.60	.70		50		40		50	1.4		1	0	1	ditto,
21	80	82	81		.68	.72	.78		50		40		50	0.5		1	2	2	ditto,
22	80	82	81		.78	.77	.80		50		30		0	0.1		3	2	2	ditto,
23	81	87	85		.78	.72	.74		40		40		20		E	1	1	0	ditto,
24	84	87	85	L. Q. 686	.72	.66	.70		20		10		10			0	0	0	Clear,
25	83	86	82		.66	.62	.70		20		0		10			0	0	0	Cloudy.
26	81	83	80		.66	.64	.72		20		20		10	1.3	SE	1	2	2	ditto,
27	80	83	81		.66	.63	.68		30		20		20	1.7		1	1	2	ditto,
28	80	81	80		.62	.60	.67		50		50		30	0.6		1	2	2	ditto,
29	80	84	81		.66	.66	.72		50		50		50	3.5		2	2	3	ditto,
30	80	85	83		.70	.73	.78		50		20		20	0.2		0	1	1	ditto,
mean	.81	85	82½		29.71	29.68	29.75		45	2	20	1	25	11.7	SE	1	1	1	

A GENERAL STATE *of the* WEATHER *for* OCTOBER 1785.

		M.	N.	E.	
Thermometer,	Greatest altitude,	84	88	85	
	Least do. ...	77	82	79	.83
	Mean do. ...	81	85½	82⅘	
Barometer,	Greatest do. ...	29.98	29.96	29.98	
	Least do. ...	22.83	29.81	29.85	
	Mean do, ...	29.90	29.87	29.96	29.91
	Greatest variation, ...	.15	.15	.13	
Hygrometer,		5 d	24 d	7 d	
	Mean density, ...	.694	.684	.692	.691

Clear, ...	21	days.
Cloudy, ...	10	do.
Thunder, ...	4	times.
Rain, ...	7	do.
Quantity of do.	1-4	inches.

The mean heat of the sun at mid-day 110°.

The wind began to set in from the NW about the 12th and 13th.

CALCUTTA, OCTOBER 1785.

Days.	Thermometer.			Mean density at each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	E.	
								d.	m.	d.	m.	d.	m						
1	83	85	84		29.84	29.80	29.85		30	20		10			NE	0	0	0	Clear,
2	81	85	83		.83	.82	.85		10	40		30				0	0	0	ditto,
3	83	87	85		.83	.81	.86	10		30		10				0	0	0	ditto.
4	82	87	84	New Moon 691	.85	.85	.90	10		40		10				0	0	1	ditto,
5	82	87	84		.88	.86	.93		0	30		0				0	0	0	ditto;
6	84	88	85		.95	.88	.92		10	10		0				0	0	0	ditto,
7	83	87	85		.90	.82	.90		0	10		0				0	0	1	ditto,
8	82	85	81		.88	.82	.90		0	10		0		0.1		1	1	1	Cloudy.
9	81	82	80		.88	.85	.91		10	0			10	0.6		1	2	2	ditto,
10	78	84	81		.91	.88	.96		10	30			10			1	1	1	ditto.
11	81	85	83	F. Q. 695	.96	.90	.94		10	20		10		0.1		0	1	0	Clear,
12	83	87	82		.94	.90	.96		0	30		10			NW	0	1	1	ditto,
13	82	87	85		.95	.90	.96		0	40		20				0	1	0	ditto,
14	83	88	85		.95	.89	.93	10		40		10				0	1	1	ditto,
15	84	88	84		.93	.91	.98		0	40		20				0	1	0	ditto,
16	83	85	85		.98	.93	.96		0	10		0				0	1	1	ditto,
17	83	87	84	Full Moon 693	.97	.92	.93		10	40		10				1	1	0	ditto,
18	81	88	85		.93	.89	.93		0	30		20				1	1	0	ditto,
19	82	88	83		.92	.96	.94		0	30		20				0	1	1	ditto,
20	81	85	83		.90	.84	.96	10		50		30				1	1	1	ditto.
21	81	86	83		.90	.88	.91	20		50		30				0	1	0	ditto,
22	79	87	82		.92	.84	.89	10		50		20				0	1	1	ditto,
23	79	86	82		.91	.87	.93	10		50		30				0	1	0	ditto,
24	80	85	83		.92	.90	.95	20		40		20				1	0	0	ditto,
25	79	86	84	L. Q. 698	.94	.90	.94		0	30		20				0	1	0	ditto,
26	79	83	79		.90	.88	.90		0	20			10	0.2	SW	0	2	2	Cloudy,
27	79	82	80		.86	.82	.88		30		10		20	R	NE	0	2	1	ditto,
28	78	82	79		.87	.84	.88		30		0		20			0	2	1	ditto,
29	77	82	79		.85	.82	.92		30		10		10			0	2	2	ditto,
30	78	82	79		.90	.86	.92		30		10		10	0.3	NW	0	1	0	ditto,
31	87	82	80		.92	.90	.95		30				10	0.1	NE	0	0	0	ditto,
mean	81	85½	82⅔		29.90	29.87	29.96	3	8	25	1	10	3	1.4	NW	⅓	1	⅔	Clear.

A GENERAL STATE *of the* WEATHER *for* NOVEMBER 1785.

		M.	N.	E.	
Thermometer,	Greatest altitude,	80	85	82	75
	Least do. ...	67	74	71	
	Mean do. ...	73	78½	75	
Barometer,	Greatest do. ...	30.10	30.08	30.12	29.98
	Least do. ...	29.90	29.82	29.80	
	Mean do. ...	29.99	29.98	30.80	
	Greatest variation, ...	.20	.26	.32	
Hygrometer,		15 d	25 d	20 d	.705
	Mean density, ...	.709	.700	.706 •	

Clear,	...	26 days.
Cloudy,	...	4 do.
Rain,		4 times.
Quantity of do.	...	0-5 Inches.

Mean heat of the sun at mid-day 100.

CALCUTTA, NOVEMBER 1785.

Days.	Thermometer			Mean morning density at each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	E.	
								d.	m.	d.	m.	d.	m.						
1	79	85	82		29.93	29.90	29.96		20	10			10		NW	0	2	0	Clear,
2	80	85	82	New Moon 696	.95	.93	30.00		20	10			10		NE	0	2	0	ditto,
3	80	84	80		.93	.97	29.96		20	20				R	NE	0	2	0	ditto,
4	79	81	79		.94	.87	.92		20				10			1	1	2	ditto,
5	77	81	79		.90	.82	.87		20				20	R		2	2	1	ditto,
6	79	82	79		.88	.85	.80		30				10			0	2	0	ditto,
7	78	81	80		.93	.90	.97		30		30			0.4		0	1	1	Cloudy,
8	77	77	75	F. Q. 706	.93	.90	.93		30		30		30			1	2	3	ditto,
9	73	76	74		.90	.92	.97		10		10		30		NW	1	1	0	Clear,
10	73	79	77		.94	.94	0.03		30	20		10				0	1	0	ditto,
11	73	80	77		30.04	30.00	.10			30		20				0	1	0	ditto,
12	75	80	76		.10	.04	.07			0		20				0	1	0	ditto,
13	74	79	75		.08	.08	.12	10		40		30				0	1	1	ditto,
14	72	77	75		.08	.03	.09	20		40		30				0	1	0	ditto,
15	72	77	75	Full Moon 710	.00	29.96	29.98	30		50		30				0	1	0	ditto,
16	72	77	75		29.90	.93	.95	40		50		30				0	1	0	ditto,
17	73	79	76		96	.96	30.00	40		50		40				0	1	0	ditto.
18	74	79	76		30.02	30.02	.06	30		40		30				0	1	0	ditto,
19	73	78	74		.06	.03	.07	30		40		30				2	0	1	ditto,
20	71	77	75		.10	.04	.11	30		40		30				1	1	1	ditto,
21	71	77	73		.07	.04	.10	10		20		10		0.1		1	2	1	Cloudy,
22	69	79	74	L. Q. 712	.05	.02	.04	10		20		10				2	2	0	Clear,
23	71	77	75		.01	29.94	29.97	10		20		10				0	1	1	ditto,
24	73	77	74		29.98	.93	.94	20		40		30				1	1	1	ditto,
25	71	77	74		.93	.90	.96	40		50		40				2	1	1	ditto,
26	71	77	72		.94	.92	.98	40		50		40				1	1	1	ditto,
27	70	75	72		30.02	30.02	30.06	40		50		46				1	1	1	ditto,
28	68	74	71		.05	.00	.05	40		50		40				1	1	1	ditto,
29	67	74	71		.05	29.97	.02	40		50		40				0	2	1	ditto,
30	67	74	72		02	.94	.00	40		50		40				0	1	0	ditto,
mean	73	78½	75		29.99	29.98	30.00	20	7	25	1	20	3	0.5	WW	½	1½	⅔	Clear.

A GENERAL STATE *of the* WEATHER *for* DECEMBER 1785.

		M.	N.	E.	
Thermometer,	Greatest altitude, ...	70	76	73	69
	Least do. ...	63	71	66	
	Mean do. ...	$65\frac{3}{4}$	$73\frac{1}{2}$	69	
Barometer,	Greatest do. ...	30.09	30.06	30.10	30.01
	Least do. ...	29.97	29.90	29.99	
	Mean do. ...	30.02	29.98	30.03	
	Greatest variation, ...	.12	.16	.11	
Hygrometer,	...	30 d	50 d	40 d	.716
	Mean density,	.721	.709	.719	

Clear, ... 31 days.

The weather throughout the month remarkably clear and pleasant, and much milder than it is usually at this season of the year.

Mean heat of the sun at mid-day about 96°

CALCUTTA, DECEMBER 1785.

Days,	Thermometer.			Mean density of each quarter of the Moon.	Barometer.			Hygrometer.						Rain	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point	M.	N.	E.	
								d.	m.	d.	m.	d.	m						
1	68	76	78	New Moon 714	30.00	29.97	29.99	30		50		40		NW	WW	1	1	0	Clear,
2	70	75	72		29.99	.95	30.00	30		50		40				0	1	0	ditto,
3	70	75	72		30.03	.98	.02	30		50		40				0	2	0	ditto,
4	69	75	72		.04	.98	.03	30		50		40				0	0	0	ditto,
5	68	75	71		.01	.96	.00	30		50		40				1	1	1	ditto,
6	67	75	71		29.98	.95	29.99	25		45		45				0	1	0	ditto,
7	67	74	71		.99	.96	.99	25		45		35				1	1	1	ditto,
8	67	74	69	F. Q. 720	.99	.99	30.04	30		45		35				0	1	1	ditto,
9	67	74	69		30.06	.99	.05	30		40		35				0	1	1	ditto,
10	67	74	69		.05	.97	.04	35		45		40				0	1	0	ditto,
11	67	75	70		.05	.94	.10	30		50		40				1	1	0	ditto,
12	68	75	70		,08	.99	.08	30		55		40				0	1	1	ditto,
13	66	75	70		.09	30.05	.08	30		55		40				0	2	1	ditto,
14	64	74	68	Full Moon 728	.06	.04	.09	30		55		45				0	1	0	ditto,
15	63	71	66		.07	.03	.09	30		60		45				1	1	1	ditto,
16	63	71	67		.08	.02	.05	30		55		40				1	1	0	ditto,
17	63	72	67		.04	.02	.04	25		35		40				0	1	1	ditto,
18	66	73	67		.03	.00	.02	25		35		40				0	1	1	ditto,
19	64	73	68		.00	.00	.01	25		40		30				1	1	0	ditto,
20	63	73	69		29.97	29.97	.05	30		40		40				1	1	1	ditto,
21	65	73	69		30.02	.98	.02	30		50		45				0	1	1	ditto,
22	65	74	69	L. Q. 722	.00	.98	.03	35		40		30				0	1	0	ditto,
23	66	73	69		.05	.97	.03	35		40		30				0	1	0	ditto,
24	67	74	68		.03	.91	.06	35		45		35				0	1	1	ditto,
25	65	73	67		.04	.90	.02	30		45		40				0	1	1	ditto,
26	64	73	67		.00	.96	.00	30		50		40				1	1	0	ditto,
27	63	72	68		29.99	.95	.00	30		55		45				0	1	1	ditto,
28	64	73	68		.98	.97	.01	30		55		50				1	1	1	ditto,
29	64	73	67		.99	.97	.04	30		55		45				0	1	0	ditto,
30	64	73	68	New Moon 728	30.06	30.04	.07	30		50		40				0	1	1	ditto,
31	63	74	67		.07	.06	.09	30		50		40				0	1	0	ditto,
mean	65¾	73½	69		30.02	29.98	30.03	30		50		40				½	1	⅔	

From the foregoing *Diary* of the Weather, it may be remarked in regard to the variation of the Barometer, that during the cold season, from November to March, the mercury is at its greatest height; and at the lowest during the rainy months of May, June, July, August, and September. The variation of the Thermometer, or the differnce between the temperature of mid-day and that of the morring and evening is very trifling, seldom exceeding 3 or 4° during the rains, whereas, during the cold season, the difference is 8 or 10°.

II.

A Synopsis of the different cases that may happen in deducing the Longitude of one place from another by means of ARNOLD'S *Chronometers, and of finding the rates when the difference of Longitude is given.—By Mr.* REUBEN BURROW.

IT was formerly the custom to give rules for calculation, without any investigation of their principles, but the contrary method has so much taken place of late, that those who are not acquainted with the theory of a subject are seldom in a capacity of calculating at all; and those who are acquainted with it, must either lose time by recurring thereto continually, or run the hazard of often making mistakes. Indeed, the use of practical rules is so obvious, that *Newton* has often given them when he has omitted their demonstrations; and the want of them has been noted by *Bacon* among the deficiencies of learning. The Hindoos were so particularly attentive in that respect, that they usually gave two rules for the same operation; one couched in the shortest terms possible, and often in verse, for the ease of the memory; and the other more at length, as an explanation. It therefore is much to be wished that authors would revert to the ancient custom so far, as to pay some attention to the reduction of their knowledge to practice; that people may not be under the necessity of investigating rules at the time that they want to use them.

The following is one rule, out of a great number, that I drew up for my own use, in determining the situations of places in India; and I insert it here on account of its utility and easiness of application.

Let E = Error of the Watch from mean time at the first place;
e = Error from mean time at the second place;
T = Time by the Watch at the second place, when the error was e;
D = Difference of Longitude between the places;
N = Interval of mean time between the observations at the two places (found by taking the interval by the Watch, and correcting it according to the estimated rate, &c.)
r = Rate of the Watch, or what it gains or loses in a day of mean time. Then,

If the Watch be too			Is the mean time at the first place when the Watch was T at the second, or when the mean time at the second place was		Then, if the second place be from the first to the		Is the rate of the Watch, and	Is the difference of Longitude.
Fast for mean time at both places, and the Watch be	Gaining,	then	T—E—nr	T—e	E	(D—E+e) : n		E—e+nr
					W	(e—E—D) : n		e—E—nr
	Losing,		T—E+nr	T—e	E	(E—D—e) : n		E—e—nr
					W	(D+E—e) : n		e—E+nr
Slow for mean time at both places, and the Watch be	Gaining,	then	T+E—nr	T+e	E	(D+E—e) : n		e—E+nr
					W	(E—D—e) : n		E—e—nr
	Losing,		T+E+nr	T+e	E	(e—E—D) : n		e—E—nr
					W	(D—E+e) : n		E—e+nr
Slow for mean time at first place and fast at second place, and the Watch be	Gaining,	then	T+E—nr	T—e	E	(D+E+e) : n		nr—e—E
					W	(E—D+e) : n		E+e—nr
	Losing,		T+E+nr	T—e	E	Impossible		
					W	(D—E—e) : n		E+e+nr
Fast for mean time at first place and slow for mean time at second place, and the Watch be	Gaining,	then	T—E—nr	T+e	E	(D—E—e) : n		E+e+nr
					W	Impossible		
	Losing,		T—E+nr	T+e	E	(E—D+e) : n		E+e—nr
					W	(D+E+e) : n		nr—E—e

III.

MEMORANDUMS *concerning* AN OLD BUILDING, *in the* Hadjipore District, *near the* Gunduc River, &c.— *By Mr.* REUBEN BURROW.

THE pyramids of *Egypt,* as well as those lately discovered in *Ireland* (and probably too the *Tower* of *Babel)* seem to have been intended for nothing more than images of *Mahadeo.*

Two of the *Sakkara* pyramids described by *Norden,* are, like many of the small ones, usually built of mud in the villages of *Bengal.* One of the pyramids of *Dashour,* drawn by *Pocock,* is nearly similar to that I am going to mention, except in the acuteness of the angle. Most of the *Pagodas* of the *Carnatic* are either complete or truncated pyramids ; and an old stone-building without any cavity, which I saw in *Yambeah,* near the *Catabeda* river, on the *Arracan* coast, differed so little from a pyramid, that I did not suspect it was meant for the image of *Seeva,* till I was told it by the natives.

The largest building of the kind which I have yet seen in *India,* is about two days journey up the *Gunduc* river, near a place called *Kessereah :* it goes by the name of "*Bheem Sain's Dewry*"*;* but seems evidently intended for the well-known image of *Mahadeo ;* having originally been a cylinder placed upon the frustum of a cone, for the purpose of being seen at a distance. It is at present very much decayed ; and it is not easy to tell whether the upper part of the cylinder has been globular or conical ; a considerable quantity of the outside is fallen down, but it still may be seen a good distance up and down the river.

The day I went from the river to view it was so uncommonly hot, that the walk and a fever together obliged me to trust to the measurements of a servant. For want of a better instrument, he took the circumference of the cylindrical part, in length of a spear, and from that as a scale, and a sketch of the building taken at a distance, I deduced the following dimensions. What dependence

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there may be on his measures, I cannot determine; but probably they are not very erroneous.

Diameter of the cylindrical part, ...	64 feet
Height of the cylinder, ...	65
Height of the conic frustum on which the cylinder is placed, ...	93
Diameter of the cone at the base, ...	363

Both the cone and the cylinder were of bricks; those of the last were of different sizes, many of them two spans long and one broad; others were of common size, but thinner; and they were well burnt, though bedded in mortar little better than mud. There did not appear any signs of the cylinder's being hollow: the conical part was overgrown with jungle; but I broke through it in several places, and found it everywhere brick.

I do not recollect whether it be visible from the site of the ancient city where the famous pillar of *Singeah* stands, or not; but have a faint idea that it is. What the intention of these extraordinary columns may have been originally, is perhaps not so easy to tell: at first sight it would seem that they were for holding inscriptions, because those of *Bettiah*, *Dehli*, and *Illahabad*, have inscriptions (though in a character that has not been yet decyphered).; but the pillar of *Singeah* seems to have none whatever, for some *Bramins* told me they attended at the time it was dug to the foundation, near twenty feet under ground, by a gentleman of *Patna*, who had hopes to have found some treasures; and that there were not the least vestige of any inscription upon it. Probably those pillars, *Cleopatra's Needle*, and the *Devil's Bolts* at *Boroughbridge*, may all have the same religious origin.

Perhaps the connection of time and place may apologize for the divercity of the subject, in mentioning, that while I sat under the shade of a large tree near the pyramid, on account of the sultry heat, some of the people of the adjacent village came and played there with *cowries* on a diagram, that was formed by placing five points in a circular order, and joining every pair of alternate points by a line, which formed a kind of pentagon; this brought to my recollection a circumstance told me by a gentleman in *England*,—That an old piece of silver plate had been dug out of the earth with such a figure upon it; the use of it was totally unknown, as well as the age; and I was desired to find what geometrical properties the figure possessed. One, I remember, was, that if any number of points whatever were placed in a circular order, and each two alternate points joined, then the sum of all the salient angles of the figure would be equal to two right angles when the number of points was odd; but equal to four right angles when the number was even. *Euclid's* properties of the angles of the triangle and trapezium, are particular cases of these; but I had no suspicion of the real intention of the figure till I saw the use here made of it. It seems however an argument in favour of the indentity of the *Druids* and *Bramins*, as well as another well known diagram, usually called the "*Walls of Troy*," which was used originally in the *Hindoo* astrology. These figures, however, appear to have flowed from a much higher source, and to have relation to what *Leibnitz* had a distant idea of in his Analysis of Situation, *Euclid* in his Porisms, and *Girard* perhaps in his Restitution of them. In fact, as the modern Algebraists have the advantage of transfering a great part of their labour from the head to the hands, so there is reason to believe that the *Hindoos* had *mechanical methods of reasoning geometrically*, much more extensive than the elementary methods made use of at present; and that even their games were deduced from and intended perhaps to be examples of them: but this deserves to be treated more at length elsewhere.

The same apology may perhaps excuse my mentioning here, that the idea of the *Nile's* deriving its floods from the melted snows, as well as the *Ganges*, appears to be rather imaginary: they seem to be caused principally by the rains; for the high hills beyond the *Herdwar* apparently retain their snow all the year, and therefore the quantity melted could never produce the enormous swell of the *Ganges;* not to mention that the effect of a thaw seems different from what would arise from the mere difference of heat, and therefore might partly take place in winter and the dry season. That the rains are sufficient for the purpose, without recurring to the hypothesis of melted snows, appears from the following fact:—A little before I observed the aforesaid pyramid I had been a considerable distance up the *Gunduc;* the river was low for the time of the year, and the hills that skirt the borders of *Nepaul* were clear, and apparently not above fifteen cose distant: soon after, a heavy shower fell upon them for some hours, and the river was in a short time filled to the very banks, and continued so for many days; and large trees were torn up by the roots, and came driving down with such force by the torrent, that my boat was often endangered. Now, on these hills there was actually no snow whatever; and as the rise was obviously caused by the rains, it may reasonably be concluded that the same effect has the same cause in other places.

IV.

OBSERVATIONS *of some of the* Eclipses *of* JUPITER'S Satellites.—*By Mr.* REUBEN BURROW.

The following in the Ganges *and* Burrampootre Rivers.

Apparent time 1787.	d	h	′	″	Satellite.	Weather.	Im. or Em.	Place of Observation.
Sept.	23	11	41	9	2	Moderate,	Imm.	Bankipore Granary,
	24	15	41	22	3	Ditto,	Imm.	Ditto,
Oct.	11	12	45	14	1	Ditto,	Imm.	Colgong ; Cleveland's Bungalo,
	23	10	26	20	3	Ditto,	Emer.	Mouth of Jellingy,
	25	11	47	39	2	Ditto,	Imm.	Shore of Ganges South of Pubna;
	25	16	42	40	1	Ditto,	Imm.	Ditto,
	27	11	13	59	1	Ditto,	Imm.	Cossundah ; Nullah,
	30	14	35	16	3	Ditto,	Emer.	Dacca ; Nabob's house,
Nov.	19	8	56	32	2	Ditto,	Imm.	Tealcopee, Burrampootre,
	26	11	33	45	2	Ditto,	Imm.	Bakkamar Chorr,
	26	13	13	57	1	Ditto,	Imm.	Ditto,
	28	7	42	52	1	Ditto,	Imm.	Cazycotta,
Dec.	3	14	10	54	2	Hazy,	Imm.	Goalparah,
	3	15	8	1	1	Moderate,	Imm.	Ditto,
	5	7	51	59	3	Ditto,	Imm.	Ditto,
	5	9	35	26	1	Ditto,	Imm.	Ditto,
	10	16	41	54	2	Very hazy,	Imm.	Budjrapore,
	10	16	56	17	1	Moderate,	Imm.	Ditto,
	12	11	26	9::	1	Hazy,	Imm.	Tingarchor,
	12	11	48	40:	3	Ditto,	Imm.	Ditto,
	19	15	28	59	1	Ditto,	Emer.	Luckipore.

The following on the Arracan Coast.

Apparent time 1788.	d	h	′	″	Satellite.	Weather.	Im. or Em.	Place of Observation.
Feb.	5	10	18	12:	1	Moderate,	Emer.	Cheduba, Flag Staff point,
	12	12	13	54	1	Alittlehazy,	Emer.	Ditto, Maykawoody Fort,
	21	8	39	29	1	Moderate,	Emer.	Yambeah Ty Fort,
	23	10	57	53	2	Ditto,	Emer.	Ditto, Kyaonemo,
	28	10	35	13	1	Ditto,	Emer.	Cheduba, Cedar Point.

The following were observed at Colonel WATSON'S Docks *at* Kidderpore, *near the mouth of the* Nullah.

Apparent time 1788.	d	h	′	″	Satellite.	Weather.	Im. or Em.	Place of Observation.
March,	15	8	36	36	1	Moderate,	Emer.	
	19	7	54	2	2	ditto,	Emer.	
	22	10	34	41	1	ditto,	Emer.	
	31	7	1	24	1	ditto,	Emer.	

The following in the Ganges *ard* Rohilcund, *&c.*

Apparent time 1788. d h ″	Satellite.	Weather.	Im. or Em.	Place of Observation.
Oct. 8 14 35 30	3	Moderate,	Emer.	Bankipore,
29 14 3 4	1	Ditto,	Imm.	Benares Observatory,
Nov. 1 15 42 36	2	Ditto,	Imm.	Chunar Camp,
12 17 44 23	1	Hazy,	Imm.	Illahabad Fort,
14 12 11 29	1	Ditto,	Imm.	Correahcotta,
20 10 48 28	3	Moderate,	Imm.	In the Ganges 3m below Nudjiff Ghur,
20 14 9 52::	3	Ditto,	Emer.	
21 13 58 32	1	Ditto,	Imm.	Jaujemow,
27 14 41 29	3	Ditto,	Imm.	Cawnpore; Magazine Gaut,
28 15 49 22	1	Ditto,	Imm.	Ditto,
30 10 17 2	1	Ditto,	Imm.	Ditto,
Dec. 3 15 2 23	2	Ditto,	Imm.	Joognagpore Gaut,
7 12 6 5	1	Ditto,	Imm.	East of Canouge, 0° 2' 29″.
14 13 54 57	1	Ditto,	Imm.	Futtyghur Magazine,
21 9 20 53	2	Ditto,	Imm.	Ditto, Dr. Cook's Gaut,
21 15 44 51	1	Ditto,	Imm.	Ditto,
23 10 12 34	1	Ditto,	Imm.	Ditto,
28 17 35 22::	1	Hazy,	Imm.	Cutterah,
30 12 2 48	1	Moderate,	Imm.	Fereedpore,
1789.				
Jan. 4 14 26 28	2	Ditto,	Imm.	Nabobgunge,
6 13 53 41	1	Ditto,	Imm.	Pillibeat; Eed Gah,
8 8 20 16:	1	Ditto,	Imm.	Shairgurr,
9 14 10 39	3	Ditto,	Imm.	Bowerkah,
22 14 15 50	1	Ditto,	Emer.	Bhyrah,
24 8 44 1	1	Ditto,	Emer.	Takoordwar,
29 14 15 36	2	Ditto,	Emer.	Nidjibabad,
29 16 7 14	1	Hazy,	Emer.	Ditto,
Feb. 14 13 22 49	3	Moderate,	Emer.	Amrooah,
14 14 23 40	1	Ditto,	Emer.	Ditto,
16 8 48 8	2	Ditto,	Emer.	Hussenpore,
16 8 51 53	1	Hazy,	Emer.	Ditto,
17 6 53 11:	4	Ditto,	Imm.	Seersah;
17 11 6 44:	4	Ditto,	Emer.	Ditto,
23 10 50 1	1	Ditto,	Emer.	Chandowsy,
March, 2 12 48 13	1	Moderate,	Emer.	Futtyghur, Dr. Cook's Gaut,
2 14 11 10	2	Ditto,	Emer.	Ditto,
11 9 22 21	1	Moderate,	Emersion.	Mobarickpore Gaut,
18 11 23 56	1	Ditto,	Emer.	Chunar Fort,
20 9 4 40	2	Ditto,	Emer.	Benares Observatory,
27 7 59 16	1	Ditto,	Emer.	Bankipore Granary.
27 11 53 1	2	Ditto,	Emer.	Ditto,
29 10 31 10	3	Ditto,	Imm.	Ditto,
Apr. 3 9 56 45:	1	Ditto,	Emer.	Patna; Chehelsuttoon,
10 11 59 48:	1	Very hazy,	Emer.	Mongeer, Rocky point,
19 8 30 56	1	Hazy,	Emer.	Rajmahal,
26 10 31 22	1	Moderate,	Emer.	Teacally Dumdumma.

The following were observed at Russahpugly *near* Calcutta.

Apparent time 1789. d h ′ ″	Satellite.	Weather.	Im. or Em.	Place of Observation.
May 12 8 46 50	1	Moderate,	Emer.	
Dec. 19 11 59 15	1	Hazy,	Imm.	
19 14 5 33	3	Ditto,	Imm.	
22 11 23 4	2	Moderate,	Imm.	
26 13 49 38	1	Ditto,	Imm.	
1790.				
Jan. 2 15 39 32	1	Ditto,	Imm.	
18 13 49 51	1	Mist &wind,	Imm.	
23 10 44 48	2	Ditto,	Imm.	

Apparent time 1789. d h ′ ″	Satellite.	Weather.	Im. or Em.	Place of Observation.
Jan. 24 9 40 57	3	Hazy,	Imm.	
27 10 8 19	1	Moderate,	Imm.	
31 13 36 35	3	Very hazy,	Imm.	
Feb. 1 17 32 48	1	Hazy,	Imm.	
3 12 1 30	1	Moderate,	Imm.	
17 10 38 18	2	Ditto,	Emer.	
19 12 33 56	1	Ditto,	Emer.	
26 14 28 38	1	Hazy,	Emer.	
28 8 57 22	1	Moderate,	Emer.	
March, 1 9 0 52	3	Ditto,	Emer.	
5 16 24 13	1	Hazy,	Emer.	
16 7 18 14	1	Moderate,	Emer.	
23 9 14 25	1	Ditto.	Emer.	
26 7 36 11	4	Ditto,	Imm.	

The two following were at Jowgatta *near* Krishnagur.

Apparent time 1790. d h ′ ″	Satellite.	Weather.	Im. or Em.	Place of Observation.
Apr. 22 10 27 30	2	Moderate,	Emer.	
22 11 31 10	1	Ditto,	Emer.	

Those to the 31st of March 1788, were observed with a glass made by *Watkins*, that magnified about 110 times; those from thence to the 12th of May 1790, were observed with one of *Ramsden's* telescopes of the sort lately made for the navy; and the remainder with a glass made by *Dolland*, that magnifies about eighty times.

I shall conclude these observations with a remark that highly concerns both the buyers and makers of telescopes; namely, that the parts which compose the object glass of an Achromatic, are generally put together in such a manner that they cannot be taken asunder; and the brass part that they are bedded in, shoots a number of chymical ramifications between the glasses, that in the course of a year renders a telescope of little or no service. This defect the maker may easily remove by making the compound object glass capable of being taken to pieces, or the parts in some other subsance not liable to this defect.

V.

A Proof that the Hindoos *had the* BINOMIAL THEOREM.

By Mr. REUBEN BURROW.

THE *Islands* in the Bay of *Bengal* are, many of them, covered with shells and marine productions to a great height, and there are beds of large smooth pebbles near the *Herdwar*, some hundreds of feet above the present level of the *Ganges ;* the sea has therefore gradually been retiring, and consequently the position of the Equator was formerly farther north than it is at present in this part of the earth : and if a few similar observations were made in other countries, it is evident that the ancient situation of the pole upon the surface of the earth might be determined sufficiently near for explaining many difficulties and paradoxes in geographical antiquities. For this purpose also it would be adviseable to have permanent meridian lines drawn in high northern latitudes, to be compared in succeeding ages, and also to have marks cut upon rocks in the sea, to shew the proper level of the water.

In the aforesaid position of the Equator, the sands of *Tartary* were inhabitable and the Siberian climates temperate ; the deserts of the *Lesser Bukharia* were then part of the seat of the *Paradise of Moses ;* and the four sacred Rivers of *Eden* went through *India, China, Siberia*, and into the *Caspian Sea*, respectively. This appears from a *Bramin* map of the world in the *Sanscrit language*, which I met with about two years ago in the higher parts of *India*, together with a valuable treatise of geography upon the system of *Boodh ;* both of which I communicated, with my idea on the subject, to Mr. *Wilford*, of the *Bengal* Engineers ; and from him the world may expect shortly to be favoured with the first true representation of Scriptural and *Hindoo* Geography.

From the aforesaid country the *Hindoo* religion probably spread over the whole earth : there are signs of it in every northern country, and in almost every system of worship. In *England* it is obvious; Stonehenge is evidently one of the Temple of *Boodh ;* and the Arithmetic, the Astronomy, Astrology, the Holidays, Games, names of the Stars, and figures of the Constellations, the ancient Monuments, Laws, and even the languages of the different nations, have the strongest marks of the same original. The worship of the sun and fire, human and animal sacrifices, &c. have apparently once been universal : the religious ceremonies of the papists seem in many parts to be a mere servile copy of those of the *Goseigns* and *Fakeers;* the Christian Ascetics were very little different from their filthy original the *Byraggys*, &c ; even the hell of the northern nations is not at all like the hell of the scripture, except in some few particulars ; but it is so striking a likeness of the hell of the *Hindoos*, that I should not at all be surprised if the story of the soldier that saw it in *Saint Patrick's* purgatory, described in *Matthew Paris's* history, should hereafter turn out to be merely a translation from the *Sanscrit*, with the names changed. The different tenets of *Popery* and *Deism* have a great similarity to the two doctrines of *Brahma* and *Boodh ;* and as the *Bramins* were the authors of the Ptolemaic system, so the *Boodhists* appear to have been the inventors of the ancient *Philolaic*, or *Copernican*, as well as of the doctrine of attraction ; and probably too the established religion of the *Greeks* and the *Eleusinian* mysteries may only be varieties of the two different sects. That the *Druids* of *Britain* were *Bramins* is beyond the least shadow of a doubt ; but that they were all murdered and their sciences lost, is out of the bounds of probability ; it is much more likely that they turned Schoolmasters, and Freemasons, and Fortune-tellers, and in this way part of their sciences might easily descend to posterity, as we find they have done. An old paper, said to have been found by *Locke*, bears a considerable degree of internal evidence both of its own antiquity and of his idea ; and on this hypothesis it will be easy to account for many difficult matters that perhaps cannot so clearly be done on any other, and particularly of the great similarity between the *Hindoo* sciences and ours : a comparison between our oldest scientific writers and those of the *Hindoos* will set the matter beyond dispute ; and fortunately the works of *Bede* carry us twelve hundred years back, which is near enough to the times of the *Druids* to give hopes of finding there some of their remains. I should have made the comparison myself, but *Bede* is not an author to be met within this country ; however, I compared an Astrolabe in the *Nagry* character (brought by Dr. *Mackinnon* from *Jynagur*) with *Chaucer's* description, and found them to agree most minutely: even the center pin which *Chaucer* calls "the horse" has a horse's head upon it in the instrument; therefore if *Chaucer's* description should happen to be a translation from *Bede*, it will be a strong argument in favour of the hypothesis, for we then could have nothing from the *Arabians.* What *Bungey* and *Swisset* may contain, will also deserve inquiry; and that the comparison may be the readier made, where the books are procurable, I mean very shortly to publish translations of the *Leelavatty* and *Beej Ganeta*, or the Arithmetic and Algebra of the *Hindoos.*

It is much to be feared, however, that many of the best treatises of the *Hindoos* are lost, and that many of those that remain are imperfect. By the help of a *Pundit* I translated part of the *Beej Ganeta* near six years ago, when no *European* but myself, I believe, even suspected that the *Hindoos* had any Algebra; but finding that my copy was imperfect, I deferred completing the translation, in hopes of procuring the remainder. I have since found a small part more, and have seen many copies; but from the plan of the work (which in my opinion is the best way of judging) they still seem to be all imperfect, though the copier generally takes care to put at the end of them that they are complete. I have the same opinion of the *Leelavatty*, and for the same reason: indeed, it is obvious that there must have been treatises existing where Algebra was carried much farther; because many of their rules in Astronomy are approximations deduced from infinite series, or at least have every appearance of it; such, for instance, as finding the sine from the arc, and the contrary; and finding the angles of a right angled triangle from the hypothenuse and sides, independent of tables of sines; and several others of a similar nature, much more complicated. I have been informed by one of their *Pundits*, that, some time ago, there were other treatises of Algebra besides that just mentioned, and much more difficult, though he had not seen them; and therefore as it is possible they may still be existing, and yet be in danger of perishing very soon it is much to be wished that people would collect as many of the books of science as possible (their poetry is in no danger) and particularly those of the doctrine of *Boodh*, which perhaps may be met with towards *Thibet.* That many of their best books are depraved and lost is evident, because there is not now a single book of geometrical elements to be met with ; and yet that they had elements no long ago, and apparently more extensive than those of *Euclid,* is obvious from some of their works of no great antiquity ; the same remarks are applicable to their Cosmographical remains, in some of which there are indications of an Astronomy superior to that of the *Soorya Siddhant*, and such popular treatises.

Till we can therefore find some of their more superior works, it must be rather from the form and construction of their astronomical tables and rules, and the properties implied in their accidental solutions of questions, &c. that we can judge what they formerly knew, than otherwise. That they were acquainted with a differential method similar to *Newton's*, I shall give many reasons for believing, in a treatise on the principles of the *Hindoo* Astronomy, which I began more than three years ago, but was prevented from finishing, by a troublesome and laborious employment that for two years gave me no leisure whatever ; and which (though the small time I had to spare since has been employed in writing a comment on the works of *Newton*, and explaining them to a very ingenious native who is translating them into *Arabic)* I hope ere long to have an opportunity of completing. At present I shall only give an extract of a paper explaining the construction of some tables, which first led me to the idea of their having a differential method : it is part of one, out of a number of papers that were written in the latter part of the year 1783 and the beginning of 1784, and of which several copies were taken by different people, and some of them sent to *England.* This particular extract was to investigate the rules at pages 253, 254, and 255 of Mons. *Gentil's* Voyage of which the author says, "Je n'ai pu savoir sur quels "principes cette table est fondee," &c. and is as follows :

"Now, by proceeding in the manner explained in the aforesaid "paper, to calculate the right ascension and ascensional difference "for *Tirvalour*, and afterwards taking the differences algebrically, "and reducing them to puls of a *Gurry*, as in the following table, "the principles of the method will be evident.

S	Obl. Ascens.		First diff. of Obl. Ascension.	Ditto reduced to Puls of a Gurry.	Do. farther reduced.
	R.A.	Asc. Diff			
	° ′	° ′	° ′ ° ′		
0	0 0	—0 0			
1	27 54	—2 19	27 54—2 19	279—23	256
2	57 49	—4 13	29 55—1 54	299—19	280
3	90 0	—4 59	32 11—0 46	322— 8	914
4	122 11	—4 13	32 11+0 46	322+ 8	330
5	152 6	—2 19	29 55+1 54	299+19	318
6	180 0	+0 0	27 54+2 19	279+23	302
7	200 54	+2 19	27 54+2 19	279+23	302
8	237 49	+4 13	29 57+1 54	299+19	318
9	270 0	+4 59	32 11+0 46	322+ 8	330
10	302 11	+4 13	32 11—0 46	322— 8	314
11	332 6	+2 19	29 55—1 54	299—19	280
12	360 0	+0 0	27 54—2 19	279—23	256

"The fifth and sixth columns sufficiently explain the tables in " page 253 and 254 of Mons. *Gentil;* but there remains a part more " difficult, namely, why in calculating the *Bauja*," or the doubles of the first differences of the ascensional difference " $\frac{20}{60}$ of the length " of the shadow is taken for the first; $\frac{4}{5}$ of the first term for the " second, and $\frac{1}{3}$ of the first term for the third." "The primary " reason of taking differences here seems to be that the chords " may be nearly equal to the arcs, and that, by adding of the " differences, the arcs themselves may be found nearly; the reason " will appear from the following investigation. Let N be the " equatorial shadow of the *Bramins* in *Bingles*, then 720 the " length of the *Gnomon*, or twelve *Ongles*, will be to N the shadow, " as radius to the tangent of the latitude; and radius to the " tangent of the latitude as the tangent of the declination to " the sine of the ascensional difference; consequently 720 is to N " as the tangent of declination to the sine of the ascensional dif" ference. Now if the declinations for one, two, and three signs " be substituted in the last proportion, we get the sines of the three " ascensional differences in terms of N and known quantities; and, " if these values be substituded in the Newtonian form for finding " the arc from the sine, we get the arcs in parts of the radius; and " if each of these be multiplied by 3600 and divided by 6,28318, " the values comes out in puls of a *Gurry* if N be in *Bingles*, but in " parts of a *Gurry* if N be in *Ongles;* and by taking the doubles, " we get the values nearly as follows:

Values.	*Difference*	
0,00000 N		
0,33056 N	0,33056 $N = \frac{1}{3}$ N nearly,	the values used by the *Bramins.*
0,59928 N	0,26872 $N = \frac{4}{5}$ of $\frac{1}{3}$ of N nearly,	
0,70860 N	0,10932 $N = \frac{1}{3}$ of $\frac{1}{3}$ N nearly,	

"Now, becasue the values in the first column are doubles of "the ascensional differences for one, two, and three signs, their "halves are the ascensional differences in parts of a *Gurry*, suppo-"sing N to be in *Ongles;* and if each of these halves be multiplied "by sixty, the products, namely, 9,9168 N, 17,9784 N, and 21,2580 "N will be the same in puls of a *Gurry;* and if to get each of "these nearly in round numbers, the whole be multiplied by three, "and afterwards divided by three, the three products will be 29,75 "N, 53,94 N, and 63,77 N, which are nearly equal to thirty N; fifty-"four N, and sixty-four N respectively; and hence the foundation "of the *Bramin* rule is evident, which directs to multiply the equa-"torial shadow by thirty, fifty-four, and sixty-four respectively; "and to divide the products by three for the *Chorardo* in puls: "and these parts answer to one, two, and three signs of longitude "from the true equinox; and therefore the *Ayanongsh*, or *Bramin* "precession of the equinox, must be added to find the intermedi-"ate *Chorardo* by proportion."

Though the agreement of this investigation with the *Bramin* results, is no proof that the *Hindus* had either the differential method, or Algebra, it gave me at the time a strong suspicion of both; and yet, for want of knowing the name that Algebra went by in *Sanscrit*, I was near two years before I found a treatise on it, and even then I should not have known what to enquire for, if it had not come into my mind to ask how they investigated their rules. Of the differential method, I have yet met with no regular treatise, but have no doubt whatever that there were such, for the reasons I before hinted at; and I hope others will be more fortunate in their enquiries after it than myself.

With respect to the *Binomial Theorem*, the application of it to fractional indices will perhaps remain for ever the exclusive property of *Newton;* but the following question and its solution evidently shew that the *Hindoos* understood it in whole numbers to the full as well as *Briggs*, and much better than *Pascal.* Dr. *Hutton*, in a valuable edition of *Sherwin's* tables, has lately done

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justice to *Briggs ;* but Mr. *Whitchell*, who some years before pointed out *Briggs* as the undoubted inventor of the differential method, said he had found some indications of the *Binomial Theorem* in much older authors. The method however by which that great man investigated the powers independent of each other, is exactly the same as that in the following translation from the *Sanscrit.*

" A *Ruja's* palace had eight doors ; now these doors may either " be opened by one at a time, or by two at a time, or by three at a " time, and so on through the whole, till at last all are opened together. It is required to tell the numbers of times that this can " be done ?

" Set down the number of the doors, and proceed in order, " gradually decreasing by one to unity, and then in a contrary " order, as follows :

8 7 6 5 4 3. 2 1
1 2 3 4 5 6 7 8

" Divide the first number eight by the unit beneath it, and the " quotient eight shews the number of times that the doors can be " opened by one at a time. Multiply this last eight by the next " term seven, and divide the product by the two beneath it, and the " result twenty-eight is the number of times that two different doors " may be opened ; multiply the last found twenty-eight by the next " figure six, and divide the product by the three beneath it, and the " quotient fifty-six shews the number of times that three different " doors may be opened. Again, this fifty-six multiplied by the " next five, and divided by the four beneath it, is seventy, the num- " ber of times that four different doors may be opened. In the same " manner fifty-six is the number of times that five can be opened, " twenty-eight the number of times that six can be opened ; eight " the number of times that seven can be opened ; and lastly, one is " the number of times the whole may be opened together, and the " sum of all the diffetent times is 255."

The demonstration is evident to mathematicians ; for as the second term's coefficient in a general equation shews the sum of the roots, therefore, in the *n* power of 1 + 1 where every root is unity, the coefficient shews the different *ones* that can be taken in *n* things : also, because the third term's coefficient is the sum of the products of all the different twos of the roots, therefore when each root is unity the products of each two roots will be unity, and therefore the number of units, or the coefficient itself, shews the number of different *twos* that can be taken in *n* things. Again, because the fourth term is the sum of the products of the different threes that can be taken among the roots, therefore, when each root is unity, the product of each three will be unity, and therefore every unit in the fourth will shew a product of three different roots, and consequently the coefficient itself shows all the different *threes* that can be taken in *n* things ; and so for the rest. I should not have added this, but that I do not know well where to refer to it.

P. S. There is an observation, perhaps worth remarking, with respect to the change of the *poles ;* namely, that the small rock-oysters are generally all dead within about a foot above high water-mark ; now possibly naturalists may be able to tell the age of such shells nearly by their appearance ; and if so, a pretty good estimate may be formed of the rate of alteration of the level of the sea in such places where they are ; for I made some astronomical observations on a rock in the sea near an island about seven miles to the south of the island of *Cheduba*, on the *Arracan Coast*, whose top was eighteen feet above high water-mark, and the whole rock covered with those shells fast grown to it, but all of them dead, except those which were a foot above the high water-mark of that day, which was February 2, 1788. The shells were evidently altered a little in proportion to their height above the water, but by no means so much as to induce one to believe that the rock had been many years out of it. All the adjacent islands and the coast shewed similar appearances, and therefore it was evidently no partial elevation by subterranean fires, or any thing of that sort ; this is also apparent from the island of *Cheduba* itself, in which there is a regular succession of sea-beaches and shells more and more decayed to a great height. By a kind of vague estimation from the trees and the coasts and shells, &c. (on which however there is not the least dependence) I supposed that the sea might be subsiding at the rate of about three inches in a year.

ADDITIONS.

Page 117. Note. The *gunjà*, I find, is the *Abrus* of our botanists; and I venture to describe it from the wild plant compared with a beautiful drawing of the flower magnified, with which I was favoured by Dr. *Anderson*.

CLASS XVII. *Order* IV.

Cal. *Perianth* funnel-shaped, indented above.

Cor. Cymbiform; *Awning* roundish, pointed, nerved.
Wings lanced, shorter than the awning.
Keel rather longer than the wings.

Stam. *Filaments* nine, some shorter; united in two sets at the top of a divided, bent, awl-shaped body.

Pist. *Germ* inserted in the calyx. *Style* very minute at the bottom of the divided body. *Stigma*, to the naked eye, obtuse; in the microscope, feathered.

Per. A legume. *Seeds*, spheroidal; black or white, or scarlet with black tips.

Leaves pinnated; some with, some without, an odd leaflet.

Page 282. See the Plate Fig. 1. The female insect in its *larva* state. 2. The egg, which produces the male. 3. The male insect. 4. The head with jointed antennæ. 5. The wings on one side. The preceding figures are much magnified, but in just proportion. 6. A piece of *Lac*, of its natural size. 7. The inside of the external coat of the cells. 8. One of the utriculi. The two last figures are a little magnified.

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